PUBLIC NOTICE
LOUISIANA DEPARTMENT OF ENVIRONMENTAL QUALITY (LDEQ)
WASTE MANAGEMENT OF LOUISIANA, L.L.C./MAGNOLIA SANITARY LANDFILL
TECHNICALLY COMPLETE SOLID WASTE PERMIT RENEWAL APPLICATION

The LDEQ, Office of Environmental Services, has determined that the permit renewal application for Waste Management of Louisiana, L.L.C., 1000 Russell Sage Road, Monroe, LA 71203 for the Magnolia Sanitary Landfill is technically complete and acceptable for public review. **The facility is located 0.5 miles south of the junction between Interstate 20 and LA Highway 594, Monroe, Ouachita Parish.**

Waste Management proposes to renew the solid waste permit for their sanitary landfill. Magnolia Sanitary Landfill operates as an Industrial/Municipal Landfill (Type I and Type II) Facility.

Written comments, written requests for a public hearing or written requests for notification of the final decision regarding this permit action may be submitted to Ms. Soumaya Ghosn at LDEQ, Public Participation Group, P.O. Box 4313, Baton Rouge, LA 70821-4313. **Written comments and/or written requests must be received by 12:30 p.m., Thursday, June 5, 2008.** Written comments will be considered prior to a final permit decision.

If LDEQ finds a significant degree of public interest, a public hearing will be held. LDEQ will send notification of the final permit decision to the applicant and to each person who has submitted written comments or a written request for notification of the final decision.

The Permit Renewal Application is available for review at the LDEQ Public Records Center, Room 127, 602 North 5th Street, Baton Rouge, LA. Viewing hours are from 8:00 a.m. to 4:30 p.m., Monday through Friday (except holidays). **The available information can also be accessed electronically on the Electronic Document Management System (EDMS) on the DEQ public website at www.deq.louisiana.gov.**

Additional copies may be reviewed at the Ouachita Parish Library-Main Branch, 1800 Stubbs Avenue, Monroe, LA 71201, Ouachita Parish Police Jury, 300 St. John Street, Monroe, LA 71210-3007 and LDEQ Northeast Regional Office, 1823 Hwy 546, West Monroe, LA 71292-0442.

Inquiries or requests for additional information regarding this permit action should be directed to Jodie L. Alexis, LDEQ, Waste Permits Division, P.O. Box 4313, Baton Rouge, LA 70821-4313, phone (225) 219-3089.

Persons wishing to be included on the LDEQ permit public notice mailing list or for other public participation related questions should contact the Public Participation Group in writing at LDEQ, P.O. Box 4313, Baton Rouge, LA 70821-4313, by email at deqmaillistrequest@la.gov or contact the LDEQ Customer Service Center at (225) 219-LDEQ (219-5337).

Permit public notices including electronic access to general information from the technically complete solid waste permit application can be viewed at the LDEQ permits public notice webpage at www.deq.louisiana.gov/apps/pubNotice/default.asp and general information related to the public participation in permitting activities can be viewed at www.deq.louisiana.gov/portal/tabid/2198/Default.aspx.

Alternatively, individuals may elect to receive the permit public notices via email by subscribing to the LDEQ permits public notice List Server at www.doa.louisiana.gov/oes/listservpage/ldeq_pn_listserv.htm

All correspondence should specify AI Number 12241, Permit Number P-0046, and Activity Number PER20050001.

Scheduled for publication: Friday, May 2, 2008

form_7131_r01
04/30/07

WM

RECEIVED

NOV 0 6 2007

WASTE PERMITS DIVISION
SOLID & HAZARDOUS WASTE SECTION

COPY

WASTE MANAGEMENT

29340 Woodside Drive
P. O. Box 99
Walker, LA 70785
(225) 665-8225
(225) 665-8238 Fax

November 2, 2007

original to IOSW
Sm copy to SW/G3/Thomas
PAAR

Mr. Bijan Sharafkhani, P.E.
Louisiana Department of Environmental Quality
Office of Environmental Services
P.O. Box 4313
Baton Rouge, LA 70821-4313

RE: Renewal Application
Final Copies
Magnolia Sanitary Landfill
✓AI No. 12241 ✓
D-073-1848/PER-20050001/P-0046 R1
Ouachita Parish

Dear Mr. Sharafkhani:

Magnolia Sanitary Landfill hereby submits six (6) final copies of the solid waste permit Renewal Application for our facility in Monroe, Louisiana. This submittal is being made in response to your request to Mr. Gabe Landry dated September 21, 2007. All previously accepted revisions have been incorporated into the appropriate sections. If you have any questions regarding this submittal please contact me at (601) 214-1144.

Sincerely,
Waste Management of LA, LLC

Mark Noel
Environmental Manager

MN/prs
c: G. Landry
P. Schneider

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NOV 0 2 2007
LDEQ

WASTE MANAGEMENT

Magnolia Sanitary Landfill
Monroe, Louisiana

Permit Renewal Application

Agency Interest No. 12241
Facility No. D-073-1848
Permit No. P-0046R1

Volume I of III

NOVEMBER 2007

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INTRODUCTION

The Magnolia Sanitary Landfill is an existing solid waste facility. The current permit was issued to the site in response to the mandatory modification application which addressed the recodified Louisiana Solid Waste Rules and Regulations (LSWRR) was submitted in October 1996. This mandatory modification was approved on February 6, 1997, and Standard Permit P-0046R1 was issued at that time.

A major permit modification to incorporate a vertical expansion to the existing site was submitted on March 18, 2002 and approved in early 2005. This renewal application presents the same technical features as were previously approved in the Vertical Expansion modification. This renewal application does not present any substantive changes from the approved permit as modified.

Permit Organization

In order to facilitate evaluation, this permit renewal application is organized in accordance with the numbering system presented in the Louisiana Administrative Code (LAC) 33:VII.Chapter 5. This permit renewal application is organized as follows:

- Part I Permit Application Form

- Part II: Supplementary Information, All Processing and Disposal Facilities
  - A. Location Characteristics
  - B. Facility Characteristics
  - C. Facility Surface Hydrology
  - D. Facility Geology
  - E. Facility Subsurface Hydrology
  - F. Facility Plans and Specifications
  - G. Facility Administrative Procedures
  - H. Facility Operational Plans
  - I. Implementation Plan
  - J. Facility Closure
  - K. Facility Post Closure
  - L. Financial Responsibility
  - M. Special Requirements

- Application Form Part III: Additional Supplementary Information

This permit renewal application includes referenced supporting documentation such as engineering reports, drawings, plans and landfill design drawings which are presented in exhibits and appendices.

Certain acronyms and abbreviations are used throughout the text of this permit modification, which are defined as follows:

LAC Louisiana Administrative Code

LSWRR	Louisiana Solid Waste Rules and Regulations
QA/QC	Quality Assurance/Quality control
STEI	Soil Testing Engineers, Inc.
SWL	Southwestern Laboratories, Inc.
LDEQ	Louisiana Department of Environmental Quality
OPPJ	Ouachita parish Police Jury
RUST E&I	Rust Environment & Infrastructure
WML	Waste Management of Louisiana
LaDOTD	Louisiana Department of Transportation and Development
NGVD	National Geodetic Vertical Datum, formerly Mean Seal Level
COE	U.S. Army Corps of Engineers

Standards governing processors and disposers of Solid Waste, currently codified as in Chapter 7, have been addressed and incorporated into the applicable modification responses presented for the Chapter 5 Sections in which the standards are referenced in accordance with LAC 33:VII.521.Part II.

The applicable sections of LAC 33:VII.713, Standards Governing Surface Impoundments (Type I and II) have been incorporated into the responses presented in accordance with LAC 33:VII.521.Part II. However, to maintain clarity and continuity, a summary of the information concerning the facility's surface impoundments is presented at the end of the appropriate Chapter 5 Sections.

SOLID WASTE STANDARD PERMIT APPLICATION - PART I

The form shall be completed in accordance with the instructions found in LAC 33:VII.513.A.1.

A. Applicant (Permit Holder): Waste Management of Louisiana, L.L.C.

B. Facility Name: Magnolia Sanitary Landfill

C. Facility Location/Description: Approximately 0.5 miles south of the junction between Interstate 20 and Louisiana Highway 594

D. Location: Section 7 Township 17N Range 5E

Parish Ouachita

Coordinates: Latitude - Degrees 32° Minutes 28' Seconds 48"

Longitude - Degrees 91° Minutes 59' Seconds 27"

E. Mailing Address: 1000 Russell Sage Road, Monroe, Louisiana 71203

F. Contact: Mr. Gabe Landry

G. Telephone: (318) 343-5636

H. Type and Purpose of Operation: (check each applicable line)

Type I

Industrial Landfill X
Industrial Surface Impoundments _______
Industrial Land farm ______

Type I-A

Industrial Incinerator Waste Handling Facility _________
Industrial Shredder/Compactor/Bailer _________
Industrial Transfer Station _______

Type II

Sanitary Landfill X
Residential/Commercial Surface Impoundment ________
Residential/Commercial Land farm ______

Type II-A

Residential Commercial Incinerator Waste Handling Facility ___________
Residential Commercial Shredder/Compactor/Baler ____________
Residential Commercial Transfer Station _________
Residential Commercial Refuse-Derived Fuel ___________

Type III

Construction/Demolition-Debris Landfill ________
Woodwaste Landfill _______
Compost Facility __________
Resource Recovery/Recycling Facility ___________

Other

Describe ____
____

I. Site Status: Owned __X__ Leased ______ Lease Term ________Years
(Note: If leased, provide copy of lease agreement)

J. Operation Status: Existing _____X____ Proposed __________

K. Total Acreage __261___ Processing Acreage ___NA___ Disposal Acreage _202____

L. Environmental Permits: (List)

LDEQ Solid Waste Standard Permit (P-0046R1)
LDEQ Water Discharge Permit (LA0075817)
Part 70 Operating Permit (2160-00075-V2)

M. Conformity with regional plans. Attach letter from the Louisiana Resource Recovery and Development Authority (LRRDA) stating that the facility is an acceptable part of the state-wide program. (See Attached)

(Note: In accordance with R.S. 30:2307.B, LRRDA authority does not apply to solid waste disposal activity occurring entirely within the boundaries of a plant, industry, or business which generates such solid waste.)

N. Zoned: Yes ______ No __X____ Zoning Requested

Zone Classification __None: See attached letter from Ouachita Parish Police Jury______

(Note: If zoned, include zoning affidavit and/or other documentation stating that the proposed use does not violate existing land-use requirements.)

O. Types, Quantities, and Sources of Waste:

	Processing		**Disposal**	
	On-Site	Off-Site	On-Site	Off-Site*
Residential	N/A	N/A	N/A	5,250 tons/week
Industrial	N/A	N/A	N/A	5,000 tons/week
Commercial	N/A	N/A	N/A	14,000 tons/week
Other	N/A	N/A	N/A	3,000 tons/week

P. Service Area:

List of Parishes: Service Area is not limited geographically or to a specific list of Parishes.

Statewide _________ Unlimited __X____

Q. Proof of Operators Public Notice - Attach proof of publication of the notice regarding the permit application submittal as required by LAC 33:VII.513.A.

R. Certification: I have personally examined and am familiar with the information submitted in the attached document, and I hereby certify under penalty of law that this information is true, accurate, and complete to the best of my knowledge. I am aware that there are significant penalties for submitting false information, including the possibility of fine and/or imprisonment.

Signature Steve Loveless

Date 10/2/05

Typed Name and Title: Steve Loveless, District Manager

Note: Attach proof of the legal authority of the signee to sign for the applicant.

Media Type (check one)
Hazardous Waste ☐ Air ☐
Solid Waste ☒ Water ☐
Radiation Licensing ☐

Agency Interest Number: 12241
Is this a copy of a previously submitted form? Yes ☐ No ☒
If yes, indicate the original submittal date: _____
If yes, indicate the original permit number: _____

Department of Environmental Quality Permits Division P.O. Box 4313 Baton Rouge, LA 70821-4313 (225) 219-3181	**Addendum to Permit Applications per LAC 33:I.1701**	LDEQ

Please Type Or Print			
	Company Name: **Waste Management of Louisiana, LLC**	☒Owner ☐Operator	For Permits Division Use Only
	Parent Company (if Company Name given above is a division)		
	Plant name (if any): **Magnolia Sanitary Landfill**		
	Nearest town: **Monroe**	Parish where located: **Ouachita**	

1. Does the company or owner have federal or state environmental permits identical to, or of a similar nature to, the permit for which you are applying in other states? (This requirement applies to all individuals, partnerships, corporations, or other entities who own a controlling interest of 50% or more in your company, or who participate in the environmental management of the facility for an entity applying for the permit or an ownership interest in the permit.)

   ☒ Permits in Louisiana. List Permit Numbers: See attachment for response.

   ☐ Permits in other states (list states): None

2. Do you owe any outstanding fees or final penalties to the Department? No☒ Yes☐
   If yes, please explain.

3. Is your company a corporation or limited liability company? No☐ Yes☒ If yes, attach a copy of your company's Certificate of Registration and/or Certificate of Good Standing from the Secretary of State.

Certification:
I certify, under provisions in Louisiana and United States law which provide criminal penalties for false statements, that based on information and belief formed after reasonable inquiry, the statements and information contained in this Addendum to the Permit Application, including all attachments thereto are true, accurate, and complete.

Responsible Official

Name	Steve Loveless
Title	District Manager
Company	Waste Management of Louisiana, LLC
Suite, mail drop, or division	Magnolia Sanitary Landfill
Street or P.O. Box	6280 Millhaven Road

City	State	Zip
Monroe	LA	71203
Business phone: (318) 343-0765		
Signature of responsible official(s): Steve Loveless		
Date: 10/3/05		

Attachment for Addendum to Permit Application per LAC: 33:1.1701

1. LAC 33:1.1701.C: Waste Management of Louisiana, LLC provides the following list of states and environmental permits identical to or of a similar nature to, the permit for which this permit application is being made, including the same information for Waste Management of Louisiana Holdings One, Inc., a Delaware corporation that owns a controlling interest (more than 50%) in Waste Management of Louisiana, LLC. There are no other individuals, partnerships, corporations, or other entities who participate in the environmental management of the Magnolia Landfill, Permit No. 0046 R1.

PERMIT NO.	FACILITY / LOCATION	PERMIT HOLDER
P-0080 R1	Woodside Landfill and Recycling Center, LOUISIANA 29375 Woodside Drive Walker, Louisiana 70785	Waste Management of Louisiana, LLC

2. LAC 33:1.1701.D.2: Waste Management of Louisiana, LLC certifies that it owes no outstanding fees or final penalties to the Department.

3. LAC 33:1.1701.D.1 Waste Management of Louisiana, LLC is a Delaware limited liability company authorized to do business in the State of Louisiana and therefore is required to register with the Secretary of State. Attached to this Attachment for Addendum to Permit Application per LAC 33:1.1701 is the Certificate of Authority issued by the Louisiana Secretary of State to Waste Management of Louisiana, LLC.

UNITED STATES OF AMERICA

State of Louisiana

Fox McKeithen

SECRETARY OF STATE

As Secretary of State, of the State of Louisiana, I do hereby Certify that

WASTE MANAGEMENT OF LOUISIANA, L.L.C.

A DELAWARE limited liability company domiciled at WILMINGTON,

Filed charter and qualified to do business in this State on March 07, 1997,

I further certify that the records of this Office indicate the company has paid all fees due the Secretary of State, and so far as the Office of the Secretary of State is concerned, is in good standing and is authorized to do business in this State.

I further certify that this certificate is not intended to reflect the financial condition of this company since this information is not available from the records of this Office.

In testimony whereof, I have hereunto set my hand and caused the Seal of my Office to be affixed at the City of Baton Rouge on,

June 26, 2002

Fox McKeithen

MBE 34553514Q

Secretary of State

STATE OF LOUISIANA
UNION JUSTICE CONFIDENCE
SECRETARY OF STATE

SIGNATURE AUTHORITY
WASTE MANAGEMENT OF LOUISIANA, LLC

I, **Charles Dees, III**, as a duly recognized corporate officer of Waste Management of Louisiana, LLC, do hereby provide authorization to **Steve Loveless, District Manager** to prepare, execute, sign and submit on behalf of the Corporation any and all permit-related documents in effect or otherwise modified or renewed as they relate to **Magnolia Sanitary Landfill.**

Charles Dees III, Vice-President
Waste Management of Louisiana, LLC
820 Gessner, Suite 940
Houston, Texas 77024

Charles D Dees III
Signature

11/09/04
Date

Louisiana Department of Environmental Quality

EDWIN W. EDWARDS
GOVERNOR

LOUISIANA RESOURCE RECOVERY AND DEVELOPMENT AUTHORITY

PATRICIA L. NORTON
SECRETARY

May 23, 1984

Mr. Terry D. Denmon, P.E.
Terry D. Denmon & Associates
Post Office Box 8460
Monroe, Louisiana 71211

Dear Mr. Denmon:

Re: Ouachita Parish Sanitary Landfill
Solid Waste Facilities Permit Application

The Louisiana Resource Recovery and Development Authority (LRRDA) is currently investigating the feasibility of constructing regional waste-to-energy facilities in several locations in the State as an economical and environmentally acceptable means of helping to solve the State's solid waste disposal problem.

At the present time, however, the LRRDA has no plans for the development of a waste-to-energy facility that would include the Monroe area. Therefore, if the Ouachita Parish Sanitary Landfill, as proposed by American Waste and Pollution Control, meets State and Federal regulations, the operation is, at this time, acceptable to the LRRDA.

Sincerely,

Donald M. Edington
LRRDA Chief Engineer

DME:cd

Ouachita Parish Police Jury

P.O. Box 3007 • Monroe, Louisiana 71210-3007
(318) 327-1340 • FAX (318) 327-1339

June 8, 2005

Susan Douglas
Sigma Engineers and Constructors, Inc.
10305 Airline Highway
Baton Rouge, Louisiana 70816

Re: Ouachita Parish Zoning Requirements

Dear Ms. Douglas:

The Ouachita Parish Police Jury has no zoning laws to control land use in Ouachita Parish outside of municipal boundaries.

Sincerely,

John Tom Murray

John Tom Murray
Director of Public Works

JTM/rd
Files: magnolia landfill zoning

PUBLIC NOTICE OF INTENT TO SUBMIT PERMIT APPLICATION MAGNOLIA SANITARY LANDFILL MONROE, OUACHITA, LOUISIANA

Notice is hereby given that Waste Management of Louisiana does intend to submit to the [illegible]artment of Environmental [illegible]y, Office of Environmental [illegible]es, Permits Division, an [illegible]ation for a permit to operate a Type I/Type II Landfill in Ouachita Parish, Range 5E, Township 17N, Section 7, which is approximately 0.5 miles south of the junction between Interstate 20 and Louisiana Highway 594.

Comments concerning the facility may be filed with the secretary of the Louisiana Department of Enviromental Quality at the following address:

Louisiana Department of Enviromental Quality
Office of Enviromental Services
Permits Division
Post Office Box 4313
Baton Rouge, Louisiana 70821-4313

Monroe, LA
October 27, 2005

Publisher of

THE NEWS-STAR
MONROE, LOUISIANA
PROOF OF PUBLICATION

The hereto attached advertisement

Was published in the NEWS-STAR.

A daily newspaper of general circulation.

Published in Monroe, Louisiana.

Parish of Ouachita in the issues of:

October 27, 2005

Amanda Brown

LEGAL AD DEPT.

Sworn and subscribed before me by

The person whose signature appears above in Monroe, LA on this

27th **day of** October **20** 05 **AD**

Virginia Huckabey

#62081 **NOTARY PUBLIC**

Public Notice of Intent To Submit Permit Application

Magnolia Sanitary Landfill
Monroe, Ouachita, Louisiana

Notice is hereby given that Waste Management of Louisiana does intend to submit to the Department of Environmental Quality, Office of Environmental Services, Permits Division, an application for a permit to operate a Type I / Type II Landfill in Ouachita Parish, Range 5E, Township 17N, Section 7, which is approximately 0.5 miles south of the junction between Interstate 20 and Louisiana Highway 594.

Comments concerning the facility may be filed with the secretary of the Louisiana Department of Environmental Quality at the following address:

Louisiana Department of Environmental Quality
Office of Environmental Services
Permits Division
Post Office Box 4313
Baton Rouge, Louisiana 70821-4313

3199188 Oct 28-1t

CAPITAL CITY PRESS
PO BOX 588
BATON ROUGE, LA 70821-0588

(225) 383-1111 FED ID NO 72-0146160

DATE: 10-28-05

ACCOUNT NUMBER: 702467

LEGAL ADVERTISING INVOICE

*** * * ORIGINAL INVOICE * * ***

SIGMA ASSOCIATES INC

10305 AIRLINE HWY
BATON ROUGE LA 70816

INVOICE NUMBER	TAG / DESCRIPTION	START DATE	STOP DATE	TIMES	SIZE	PMT/CREDITS	AMOUNT DUE
T0319918810	WASTE MGMT TYPE I/II	10/28/05	10/28/05	1	210.0		400.50

LEGAL ADVERTISING INVOICE AFFIDAVITS WILL BE SENT SEPARATELY

LEGAL ADVERTISING INVOICE
THE ADVOCATE / SATURDAY / SUNDAY ADVOCATE

* PLEASE RETURN THIS PORTION WITH REMITTANCE *

ACCOUNT NUMBER	702467

INVOICE NUMBER	AMOUNT DUE
T0319918810	400.50

DO NOT FOLD STAPLE OR MUTILATE

REMIT AMOUNT $ ____________

CHECK NO ____________

SIGMA ASSOCIATES INC

10305 AIRLINE HWY
BATON ROUGE LA 70816

CAPITAL CITY PRESS
PO BOX 588
BATON ROUGE, LA 70821-0588

CAPITAL CITY PRESS

Publisher of
THE ADVOCATE

PROOF OF PUBLICATION

The hereto attached notice was
published in THE ADVOCATE,
a daily newspaper of general circulation
published in Baton Rouge, Louisiana,
and the official Journal
of the State of Louisiana,
the City of Baton Rouge,
and the Parish of East Baton Rouge,
in the following issues:
10/28/05

Susan A. Bush, Public Notices Clerk

Sworn and subscribed before me by the
person whose signature appears above:
October 28, 2005

Pegeen Singley, Notary Public, #66565
My Commission Expires: Indefinite
Baton Rouge, Louisiana

Public Notice of Intent To Submit Permit Application

Magnolia Sanitary Landfill
Monroe, Ouachita, Louisiana

Notice is hereby given that Waste Management of Louisiana does intend to submit to the Department of Environmental Quality, Office of Environmental Services, Permits Division, an application for a permit to operate a Type I / Type II Landfill in Ouachita Parish, Range 5E, Township 17N, Section 7, which is approximately 0.5 miles south of the junction between Interstate 20 and Louisiana Highway 594.

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Louisiana Department of Environmental Quality
Office of Environmental Services
Permits Division
Post Office Box 4313
Baton Rouge, Louisiana 70821-4313

3199188 Oct 28-1t

SIGMA ASSOCIATES INC 3199188
SUSAN DOUGLAS
10305 AIRLINE HWY
BATON ROUGE LA 70816

LAC 33:VII.521. Part II: Supplementary Information, All Processing and Disposal Facilities

(Note: All applicable sections of LAC 33:VII. Chapter 7 were addressed and incorporated into the responses presented below in accordance with LAC 33:VII.521.Part II.)

521.A. Location Characteristics. Standards pertaining to location characteristics are contained in LAC 33:VII.709.A (Type I and II facilities).

521.A.1. The following information on location characteristics is required for all facilities:

521.A.1. a. Area Master Plans - a location map showing the facility, road network, major drainage systems, drainage-flow patterns, location of closest population center(s), location of the public-use airport(s) used by turbojet aircraft or piston-type aircraft, proof of notification of affected airport and Federal Aviation Administration as provided in LAC 33:VII.709.A.2, location of the 100-year flood plain, and other pertinent information. The scale of the maps and drawings must be legible, and engineering drawings are required.

A location map including the areas to be served, road networks, major drainage systems and other pertinent information is included in the Area Master Plan presented as Exhibit A.1. Additionally, the Site Master Plan which includes all pertinent site features is included as Exhibit A.2. These details are in the "Exhibits" section of this application.

The Area Master Plan is a vicinity map identifying the site location in Ouachita Parish, the road network, the area major drainage systems, drainage flow patterns, the location of the closest population center, the location of the nearest public-use airport and other pertinent information. Based on the 2000 census figures, the City of Monroe is classified as a Metropolitan Statistical Area, with a city population of 53, 107 residents. The 2000 census reports that the population for Ouachita Parish is 147,250 residents. Approximately 47 % of these residents live in or immediately outside three (Monroe, West Monroe, and Richwood) of the four incorporated cities.

There are 399,082 acres in this parish. Seventy-five (75) percent of the land mass has been identified as "Developed", fifteen (15) percent is "Undeveloped" and the remaining ten (10) percent is assigned to an "Open & Water" category. No significant alteration of land use patterns is expected; residential developments west and north of the twin cities (Monroe and West Monroe) will certainly maintain their historical up-trending in housing development densities.

The location of the nearest public-use airport runway is provided in Exhibit A.1 (Area Master Plan). As indicated on the Area Master Plan, Magnolia Sanitary Landfill is not located within 10,000 feet of a public-use airport runway end used by turbojet aircraft or within 5,000 feet of a public-use airport runway end used by only piston-type aircraft. The City of Monroe, Planning and Urban Development Department was contacted in regards to the location of the nearest airport (public or private) to the site. In a letter dated May 11, 1984, the Planning and Urban Development Department indicated that the nearest airport is the Monroe Municipal Airport, which is located approximately 12,000 feet northwest of the site. Therefore, demonstration is not required that the units of the landfill are designed and operated so that the landfill units do not pose a bird hazard. A copy of the May 11, 1984 letter is presented as Exhibit A.11.

Additionally, owners or operators proposing to site new MSWLF units and/or lateral expansions within a five-mile radius of any airport runway end used by turbojet or piston-type aircraft to notify the affected airport and the FAA. As previously mentioned, the site is located within a five-mile radius of the Monroe Municipal Airport. As demonstrated in the Notice Of Proposed Construction or Alteration Form (FAA Form 7460-1) submitted both to the FAA and the Monroe Municipal Airport, notification of construction and use of new, permitted landfill units has been given to these authorities. A copy of the FAA forms submitted for Magnolia to both the FAA and the Monroe Airport are presented as Exhibit A.12 and A.13, respectively.

Major road and drainage systems are identified on the Area Master Plan (Exhibit A.1). The landfill is extraordinarily accessible to eighty-nine (89) percent of all parish residents even though the nearest housing unit is more than one (1) mile away. The location is ideal because it is only 2,200 feet off the south bound interchange of Interstate 20 and La. Highway 594. Also, it is less than five (5) miles east of the U.S. 165 (north/south) and Interstate 20 (east/west) exchange.

The only public access to the facility is Louisiana Highway 594, a two lane, asphalt-paved and drainage improved roadway. Louisiana Hwy. 594 connects to Interstate 20 approximately one-half (1/2) mile north of the facility entrance. The path of this road from Interstate 20 to the entrance of the landfill does not have sharp turns, obstructions, or other hazards conducive to accidents per LAC 33:VII.709.A.1. Louisiana Hwy. 594 can withstand the weight of all transportation vehicles that access Magnolia Sanitary Landfill and meets the requirements of LAC 33:VII.709.A.1. (Refer to LAC 33:VII.521.A.1.b of this Section).

All access roads within the landfill waste management areas are surfaced with rock or gravel to provide all-weather access. The on-site access roads are designed to avoid, to the extent practicable, congestion, obstructions and other hazards conducive to accidents. Since these roads are located on the top of or above the perimeter levee, they are located at an elevation greater than the 100-year flood elevation.

Important north/south drainage systems are the Ouachita River and Bayou Lafourche. The latter drains the sectors in which the landfill site is located. East/west prevails include L 11 Canal, Prairie Bayou and Youngs Bayou. Only Youngs Bayou handles surface runoff from the site area. Specifically the landfill is three (3) miles west of Bayou Lafourche and two and three-fourths (2 3/4) miles north of Youngs Bayou. Proper onsite surface water management will prevent impacts on either watercourse. Additional information regarding surface hydrology, surface water management, site and area drainage, and the location of the 100-year floodplain is presented in LAC 33:VII.521.C - Facility Surface Hydrology.

521.A.1. b. A letter from the appropriate agency or agencies for those facilities receiving waste generated off-site, stating that the facility will not have a significant adverse impact on the traffic flow of area roadways and that the construction, maintenance, or proposed upgrading of such roads is adequate to withstand the weight of the vehicles.

Documentation from the Louisiana Department of Transportation and Development (DOTD) stating that the traffic associated with the operations at Magnolia Sanitary Landfill are not having an adverse impact on the area roadways is provided as Exhibit A.3. The letter from the Louisiana DOTD dated June 10, 2005 states that current traffic flow and the quality of the area roadways are not being significantly impacted by operations of the landfill. Additionally, maintenance, construction and upgrading of area roadways will be adequate to withstand the weight of the solid waste collection vehicles which utilize Magnolia Sanitary Landfill.

521.A.1. c. Existing Land Use - a description of the total existing land use within three miles of the facility (by approximate percentage) including, but not limited to:

- **i. residential;**
- **ii. health-care facilities and schools;**
- **iii. agricultural;**
- **iv. industrial and manufacturing;**
- **v. other commercial;**
- **vi. recreational; and**
- **vii. undeveloped.**

Existing land use within a three-mile radius of Magnolia Sanitary Landfill has been estimated based on available maps, published information, an area visual reconnaissance and through general knowledge of Ouachita Parish. Based on this information, the land use for the area within a three-mile radius of the facility, by approximate percentages, is estimated to be as follows:

residential - 2%
health care facilities & schools - <1%
agricultural - 20%
industrial/manufacturing - 3%
other commercial - 5%
recreational - 25%
undeveloped (forested land) - 45%

Note: The approximate 25% land use representing recreational area is the Russell Sage Wildlife Management Area which is located east and southeast of the landfill. The category of land use representing undeveloped land (45%) can be better described as forested areas. As demonstrated in the letter from the Ouachita Parish Police Jury presented as Exhibit A.14, local or parish land use/zoning ordinances do not exist that preclude the location and operation of a landfill in the area of the Magnolia Sanitary Landfill.

521.A.1. d. Aerial Photograph - a current aerial photograph, representative of the current land use, of a one-mile radius surrounding the facility. The aerial photograph shall be of sufficient scale to depict all pertinent features.

A current aerial photograph, representative of the current land use within a one mile radius of Magnolia Sanitary Landfill is provided as Exhibit A.4. The aerial survey was performed on April 15, 2005.

521.A.1. e. Environmental Characteristics - the following information on environmental characteristics:

521.A.1.e. i. a list of all known historic sites, recreation areas, archaeologic sites, designated wildlife-management areas, swamps and marshes, wetlands, habitats for endangered species, and other sensitive ecologic areas within 1,000 feet of the facility perimeter or as otherwise appropriate;

In a letter dated June 30, 2005, the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development indicated that there were no known archaeological or historical sites within 1,000 feet of the site (See Exhibit A.5). In a similar letter dated June 14, 2005, the Office of State Parks Stated that there are no holdings of theirs within 1000 feet of the landfill.

In June 27, 2005 correspondence, the Louisiana Department of Wildlife and Fisheries (LDWF) indicated that no known rare, threatened or endangered species or critical habitat was found within the area of the project. The letter stated that the Russell Sage Wildlife Management Area (WMA) is within one quarter mile of the project, and requested that further contact be made to coordinate activities concerning the WMA.

The Russell Sage WMA lies immediately east of the site, but is separated from the landfill property by a buffer zone, the facility perimeter levee, and a private road with drainage ditches on both sides. The LDWF previously reviewed the operational plans of the landfill facility, and concluded that proper operation of the landfill facility would not have any adverse impacts on the management area. LDWF has confirmed this position in conversations held during the preparation of this renewal application. Copies of the October 22, 1984 review and October 25, 2005 confirmatory correspondence can be found in Exhibit A.7. Refer to LAC 33:VII.521.A.1.e.iii for a detailed description of the measures planned to protect the areas listed above from adverse impact of operation at the facility.

521.A.1.e. **ii.** **documentation from the appropriate state and federal agencies substantiating the historic sites, recreation areas, archaeologic sites, designated wildlife-management areas, wetlands, habitats for endangered species, and other sensitive ecologic areas within 1,000 feet of the facility; and**

The documentation from the Louisiana Department of Culture, Recreation and Tourism and the Louisiana Department of Wildlife and Fisheries are presented in Exhibit A - Location Characteristics Documentation. As stated above, a portion of the Russell Sage WMA, (a designated wildlife management area owned by the Louisiana DWF) shares the eastern boundary of the landfill site. The wildlife management area and the landfill site are separated by a buffer zone, the facility perimeter levee, and a private road with drainage ditches on both sides. Several measures have been included in the facility design and operating procedures to avoid any negative impact from operations on the wildlife management area, as described in the following response. A letter from the U.S. Army Corps of Engineers which provides a preliminary wetlands determination for areas within 1000 feet of the facility is included in Exhibit 8.1. While the access road from Russell Sage Road does cross these potential wetlands, no landfill activities take place within the areas within 1000 feet of the facility.

521.A.1.e. iii. a description of the measures planned to protect the areas listed from the adverse impact of operation at the facility.

Negative impacts on the Russell Sage Wildlife Management Area have been and will continue to be precluded by implementing the following design and operating provisions (Refer to LAC 33:VII.521.F - Facility Plans and Specifications for landfill design details, and LAC 33:VII.521.H - Facility Operational Plans for landfill operations details):

1. Public access to the site is limited to the site entry in the northeast corner of the property, which is in close proximity to Interstate 20, the predominant route of travel of the collection vehicles. Travel through the Management Area en route to the site is not anticipated.

2. A signage program clearly details disposal operations and prohibitions.

3. No landfilling occurs within or will be allowed within the buffer zone which currently exists in all directions around the permitted landfill area.

4. The site was cleared for agricultural use a number of years ago. The remaining tree buffer along the site perimeter will be preserved, where possible.

5. As a protective measure to the surrounding properties, a protective perimeter levee was placed between the permitted landfill area and the surrounding properties to exclude these areas from landfill operations. The levee, which totally encompasses all disposal activities, has been constructed to an elevation at least two feet above the 100-year flood elevation.

6. Runoff from the site is collected in the perimeter ditch on the outside of the levee. This ditch, which is designed to convey runoff from the 25 year, 24 hour storm to the northwest corner of the property, and then to Gourd Bayou - Improved. As such, no site runoff is routed through the Management Area.

7. Extensive compaction techniques and application of cover material daily control odors, litter and vector harborage.

8. Fill areas are brought up to design grades and final cover on an ongoing basis.

521.A.1. f. a wetlands demonstration, if applicable, as provided in LAC 33:VII.709.A.4.

Cells 1 through 11 of Magnolia Sanitary Landfill received waste prior to the October 9, 1993 effective date of this requirement; therefore, the wetlands demonstration requirements of LAC 33:VII.709.A.4. are not applicable to this portion of the landfill. The remaining permitted area of Magnolia Landfill which did not accept waste prior to October 9, 1993, is not located in a wetlands area and, therefore, this requirement does not apply as demonstrated in the following paragraph.

As part of the original permit requirements, the Vicksburg District COE visited the site in 1985 to determine if wetlands were located at the proposed landfill site. In a letter dated May 21, 1985, the COE determined that the proposed landfill would not require a Department of the Army Section 404 permit based on their review of available information and their on-site inspection the site. This conclusion, in effect, is the same as determining there were no jurisdictional wetlands on this site at that time. This Jurisdictional Determination was revisited, and the July 20, 2005 letter from the COE stating that there are no jurisdictional wetlands and/or other water of the United States on the property is included as Exhibit A.8

521.A.1. g. Demographic Information - the estimated population density within a three-mile radius of the facility boundary, based on the latest census figures.

A three mile radius of the Magnolia Sanitary Landfill boundary includes only a small portion of the City of Monroe (easternmost boundary near the Monroe Municipal Airport) and the small communities of Millhaven (approximately one mile north), Magenta (approximately two miles to the northwest), and Pine Grove (approximately three miles to the southwest). The three mile radius is located almost entirely in Ouachita Parish with the exception of a small portion of Richland Parish located along Bayou Lafourche. Based on the latest available census and demographic information (2000 census) from the CENSUS 2000 website, the approximate population located within a three mile radius of the landfill is estimated at 5,046. The population for the three mile radius of the facility was determined by the breakdown of persons in designated "tracts" or geographic locations for the purpose of establishing voting precincts within the Parish. The following tracts were partially located within the three mile radius of the landfill:

Tract 6 = 4,459
Tract 101.02 = 5,415
Tract 106.03 = 5,876

These tracts were identified by plotting the landfill location and the three mile radius on the Census Tract/Block Numbering Area Outline Map. A population density was calculated for each of the tracts. This density was then multiplied by the actual area that each tract occupies within the 3 mile radius. The population within the 3 mile radius was the sum of the contributions as seen below:

Tract 6 = 1,524
Tract 101.02 = 1,176
Tract 106.03 = 2,346

521.A.2. The following information regarding wells, faults and utilities is required for Type I and II facilities:

521.A.2. a. Wells

Map showing the locations of all known or recorded shot holes and seismic lines, private water wells, oil and/or gas wells, operating or abandoned, within the facility and within 2,000 feet of the facility perimeter and the locations of all public water systems, industrial water wells, and irrigation wells within one mile of the facility. A plan shall be provided to prevent adverse effects on the environment from the wells and shot holes located on the site.

Magnolia Sanitary Landfill owns, operates and maintains a private water well. Additionally, a total of twelve shallow monitoring wells and two piezometers are located within the property boundaries of the facility specifically for the purpose of monitoring groundwater quality. A map indicating the location of all existing private water wells, within the facility and within 2,000 feet of the facility perimeter is provided as Exhibit A.9. Additionally, the location of all existing public water wells/systems, industrial water wells and irrigation wells within a one mile radius of the facility is provided in Exhibit A.9. A computer list of all wells within a one-mile radius of the landfill, registered with the Louisiana Department of Transportation and Development (DOTD), including the respective depth and usage is also included in Exhibit A.9. A search of the Louisiana Department of Natural Resources database was done to determine if there were any oil and/or natural gas wells, known or recorded shot holes and seismic lines within 2,000 feet of the facility perimeter. No oil and/or natural gas wells were found. The DNR indicated that their office did not maintain or record data regarding the location of shot holes and seismic lines and that information similar to this was virtually impossible to tabulate. Additionally, the DNR did not know of any agency which recorded or maintained such information. A copy of the printout is provided in Exhibit A.9.

As indicated by the Louisiana DOTD water well survey dated June 2, 2005, a total of four water wells are located within a mile of the facility boundaries. Of these four wells, two wells are located within the facility or within 2,000 feet of the facility, these being Well #561 - owned by Magnolia, and Well 6157z – an irrigation well owned by R.W. Tidwell. One active irrigation well and one active private (domestic) well are located greater than 2,000 feet from the facility, but within the specified one mile radius of the facility. The map showing these wells is included in Exhibit A.9.

The monitoring wells on site are utilized solely for the purpose of monitoring shallow groundwater quality beneath the site surface. Adverse effects on the environment are not occurring nor are any anticipated from the existence of these wells or the monitoring activities conducted at the site monitor wells. The facility monitor wells remain locked at all times and only trained and certified technicians access the wells for monitoring and sampling purposes. After post-closure monitoring requirements of the facility have been met, the monitoring well system will be properly plugged and abandoned in accordance with all applicable State requirements.

The nearest public water system (City of Monroe distribution system) is at the Guide Division Plant, General Motors Corporation. This facility is approximately 4,500 ft. north of the site. The City's water supply comes from Bayou DeSiard; their primary in-take point is not less than 10 miles northwest of this location.

521.A.2. b. Faults

521.A.2.b. i. Scaled map showing the locations of all recorded faults within the facility and within one mile of the perimeter of the facility; and

A review of aerial photographs and published information has revealed no evidence that faulting exists within the facility or within one mile of the perimeter of the facility which has displaced the Recent (Holocene) alluvial sediments. Three state geologic maps were reviewed to determine the presence of faulting including the "Aquifer Recharge Potential of the Shreveport Quadrangle", Map #5 (1988) and the adjoining map entitled "Aquifer Recharge Potential of the Jackson Quadrangle", Map #6 (1988), both of the Aquifer Recharge Atlas, Louisiana Geological Survey; and the "Geologic Map of Louisiana" (1984), Louisiana Geological Survey. As shown in Exhibit A.10, a color copy of the "Geologic Map of Louisiana" did not indicate the presence of faulting in the area of Magnolia Sanitary Landfill. The nearest fault to the landfill is located approximately 47 miles west-southwest of the landfill in Bienville Parish, Louisiana. Review of aerial photographs of the site and the immediate area surrounding the site and site visits confirmed the information of the above referenced maps that faulting does not exist in the area of the landfill.

521.A.2.b. **ii.** **demonstration, if applicable, of alternative fault set-back distance as provided in LAC 33:VII.709.A.5.**

As demonstrated in the response to LAC 33:VII.521.A.2.b.i, faulting which has had displacement in the Holocene time does not exist within 200 feet (60 meters) of the facility perimeter.

521.A.2. **c.** **Utilities**

Scale map showing the location of all pipelines, power lines, and right-of-ways within the site.

The location of all pipelines, power lines and right-of-ways within Magnolia Sanitary Landfill are shown on the Site Master Plan provided as Exhibit A.2.

521.B. Facility Characteristics. Standards concerning facility characteristics are contained in LAC 33.VII.709.B (Type I and II facilities). A facility plan, including drawings and a narrative, describing the information required below must be provided.

(Note: All applicable sections of LAC 33:VII.Chapter 7 were addressed and incorporated into the responses presented below in accordance with LAC 33:VII.521.Part II.)

521.B.1. The following information is required for all facilities:

521.B.1. a. elements of the process or disposal system employed, including, as applicable, property lines, original contours (shown at not greater than five-foot intervals), buildings, units of the facility, drainage, ditches and roads;

Site plans including property lines, buildings, facilities, excavations, drainage, roads and other elements of the disposal system are part of Exhibits A.1 and A.2. The original site contours are presented in Exhibit B.1 - Original Contour Plan. Facility elements are presented in Appendix E and include the following design drawings: Drawing No. 1 - Existing Conditions Plan; Drawing No. 2 - Excavation Plan; Drawing No. 3 - Liner System Plan; Drawing No. 4 - Leachate Collection System Plan; and Drawing No. 6 - Landfill Development Plan.

Property lines of this half section (261.30 acres) were surveyed and are identified in the exhibits. The metes and bounds description is presented in Appendix A.

Additional property was acquired for more direct and safer egress. This parcel (0.16 acres) was surveyed and is identified in the exhibits. The metes and bounds description is presented in Appendix B.

Original contours range from 61 ft. NGVD to 64 ft. NGVD; final contours have been designed to a maximum height of 200 feet NGVD with a minimum top slope of about approximately 4%. A detail drawing of the final contours are presented in Drawing No. 5 of Appendix E.

On-site buildings consist of a 15 ft. by 40 ft. scale house and a 60 ft. by 70 ft. maintenance building. Other facilities include an in-place scale for quantitative, electronic reporting of entry and exit weights. The size, type, and number of buildings (e.g. brick, metal, etc.) may be varied depending upon facility operational requirements.

521.B.1. b. the perimeter barrier and other control measures;

Magnolia Sanitary Landfill maintains all required postings and markings, proper entrance security and adequate perimeter barriers around the facility that prevent unauthorized ingress or egress, except by willful entry. The security system includes: six-foot chain link fence, multi-strand barbed wire fence, and heavy vegetative growth maintained around the perimeter of the facility; locked or continuously-manned entrance gates; heavy vegetative growth on three sides of the facility perimeter; and an entry system which prevents unauthorized persons from having ingress or egress to the active landfill area, except by willful entry, in accordance with the provisions in LAC 33:VII.709.B.1.a. Perimeter barriers include, but are not limited to, required signs and postings, and proper entrance security. All facility entry points are kept monitored, manned, or locked during operating hours. Even though the perimeter fence will not prevent all unauthorized entry to the site, it will provide an adequate barrier to discourage unauthorized site entry. The entire site is posted as appropriate to discourage trespassing. The locations of the barriers preventing unauthorized access to the landfill are shown on the Site Master Plan (See Exhibit A.2). Internal security control measures, such as fences, gates, and other systems which prohibit unauthorized entry, will be constructed and/or removed within the perimeter barrier system as facility development warrants.

Additional perimeter barriers include the buffer zone (Refer to LAC 33:VII.521.B.1.c and 709.B.2), natural barriers including heavy vegetative growth on three sides of the facility perimeter, a 600-acre parcel of farmland with limited access on the remaining property boundary, and the perimeter drainage ditches which surround the entire facility.

A single main access road is located at the northeast corner of the facility. This public entrance located on Louisiana Highway 594 will be the only entrance used for disposal activities. This entryway includes chain link fence and lockable, iron gates. Additional entrance gates providing limited access for construction equipment, etc. are located on the western property boundary. Access roads leading to the waste management areas of the landfill are within the main facility where entrance is continually monitored during operating hours. Security checks of the waste management areas are made periodically throughout the day.

During operating hours, the main entrance and construction gate will be continuously manned or monitored to prevent any unauthorized entry to the facility. The main entrance to the facility will be the only open access to the landfill during operating hours for public and private disposal activities. After operating hours, the main entrance gate will be locked and secured. Any other access points to the landfill will remain locked at all times during non-operating hours. The hours stated are for the receipt of waste only.

Other activities pertaining to the landfill including construction, equipment maintenance, office procedures, etc. may be conducted beyond these hours. The main entrance gate and any other access points to the landfill will be locked and secured at all times when the facility is un-manned.

Magnolia Sanitary Landfill does not accept certain types of wastes such as hazardous wastes, etc. The entrance to the landfill is posted with appropriate, readable signs in plain view that list all types of wastes that can be received at the facility. Additionally, signs indicating certain wastes which can not be received, (i.e. - hazardous wastes), are also posted in plain view.

521.B.1. c. a buffer zone;

The 200-foot setback (buffer zone) exists in two directions (north and south boundary lines) around the current permitted landfill facility in accordance with the provisions in LAC 33:VII.709.B.2.a. At the time of the initial permitting process for the landfill, the buffer zone requirement was waived to the west of the facility. The property owner of this parcel of land, Mr. Hershel R. Sullivan, waived the 200-foot requirement and allowed for a reduction in the regulated buffer zone requirements to 100 feet along the western boundary line (See Appendix C). Since the time of original permit submittal, the property to the west of the facility has been purchased by Waste Management of Louisiana from Mr. Sullivan with the 200-foot buffer zone waiver still in effect. Additionally, in March 1997 the Louisiana Wildlife and Fisheries, waived the 200-foot buffer zone requirement to the east of the facility. The Louisiana Wildlife and Fisheries also waived any objection to and granted permission for the construction, placement, existence and/or operation of gas flares, extraction devices and/or gas-to-energy facilities or units within the 200-foot buffer zone. A copy of a notarized affidavit by the Louisiana Wildlife and Fisheries which waived the 200-foot requirement is provided in Appendix C.

521.B.1. d. fire-protection measures;

The available fire protection and medical care facilities are identified in the Contingency and Emergency Procedures Plan presented as Appendix N. Fire protection in every work area is provided by the appropriate type of fire extinguisher. Personal safety is further augmented through safeguards such as prohibitions against open burning, periodic training and posted caution notices. Accidental fires will be extinguished using stockpiled soil and, when necessary, a water truck.

An adequate complement of fire extinguishers and equipment is located in every building. All heavy equipment carries at least one 20 pound dry chemical extinguisher. Every service and supervisor assigned vehicle is equipped with a 10 pound or equivalent dry chemical fire extinguisher.

Parish and city fire departments have been notified of site use and user conditions as a precaution and in case of requested assistance. See Exhibit A.15 for correspondence from emergency response organizations. The "first response" station by agreement and through cooperative aid between parish and city is the airport station, which has a route time of less than ten (10) minutes. Emergency numbers are conspicuously posted at telephones in the facility.

521.B.1. e. landscaping and other beautification efforts;

Waste Management of Louisiana, Inc. considers the appearance of Magnolia Sanitary Landfill a priority and has taken several steps in providing and maintaining attractive landscaping to improve the aesthetics of the facility and the surrounding area. The entire area surrounding the landfill, including Russell Sage Road, the area outside and in the vicinity of the entrance, and the entrance to the landfill are routinely inspected and cleaned up as needed by landfill maintenance crews.

The entrance to the facility provides easy-to-read and plain view instructions for haulers. Scale areas, drop-off areas, maintenance areas and truck parking areas are all kept well maintained and litter-free. All roadways are easily accessible and free of debris or obstruction.

521.B.1. f. devices or methods to determine, record, and monitor incoming wastes.

Recordkeeping is routinely and properly maintained to effectively manage the operation and to prepare the necessary reports in accordance with administrative requirements of the State. A detailed description of the daily operations and waste acceptance procedures of the landfill, which further describes the monitoring of incoming wastes, is presented in Section H and the Quality Assurance and Quality Control Program for Waste Acceptance (Appendix L) of this permit renewal.

Upon arrival at the site, all vehicles, commercial or private, with incoming waste are instructed by signage to stop at the facility gatehouse. The gatehouse, in accordance with LAC 33:VII.709.B.5.a. and b. is equipped with a central control and recordkeeping system for tabulating information on the waste. Utilizing scales, the system records the quantity (by wet-weight tonnage); sources (whether the waste was generated in-state or out-of-state and, if it is industrial solid waste, where it was generated); and types of incoming waste (i.e., commercial, residential). In the event of scale breakdown, the amount of waste is estimated and recorded in estimated tons. If volume has to be estimated in cubic yards, the waste volume will be converted using a ratio of 5 loose cubic yards to 1 ton of waste.

The waste delivery and recording system in conjunction with the facility security system allows only limited and controlled access to the disposal area. The controlled and documented entry along with the random inspection of incoming waste loads will reasonably ensure exclusion of prohibited waste.

All of the above information obtained concerning the waste is organized and then catalogued and filed or recorded and stored electronically . Recordkeeping is routinely and properly maintained to effectively manage the operation and to prepare the necessary reports in accordance with administrative requirements of the State.

521.B.1. g. NPDES discharge points (existing and proposed); and

Currently, only one discharge point exists at Magnolia Sanitary Landfill. The existing discharge point, identified as Outfall 001, is shown in Exhibit A.2. A Louisiana Pollutant Discharge Elimination System Permit (LA0075817) has been issued to the site, and is included in Appendix Q. Outfall 001 discharges to the perimeter drainage ditch located along the west side of the facility. The drainage ditch empties to Gourd Bayou Improved located directly west of the landfill. Gourd Bayou Improved continues south from the landfill to a final outfall to Young's Bayou.

521.B.1. h. other features, as appropriate.

Magnolia Sanitary Landfill utilizes the latest technologies in providing environmental protection including a state-of-the-art liner system, a leachate collection and removal system, a groundwater monitoring network and several inspection measures to ensure that all material entering the facility is non-hazardous.

521.B.2 The following information is required for Type I and II facilities:

521.B.2. a. areas for isolating nonputrescible waste or incinerator ash, and borrow areas; and

The isolation of areas for nonputrescible waste or incinerator ash and borrow areas is provided by the construction of certified disposal areas. No wastes are placed in any areas until the regulatory certification, inspection, and approval documentation process is completed. Since no waste is allowed outside the limits of the disposal areas, the borrow areas remain isolated from disposal activities.

Clay borrow material needed during the construction of the facility will be selected from soils obtained during excavation of future cells. Additionally, borrow may be obtained from off-site property owned by private landowners. Significant portions of the borrowed materials will be used for construction of the recompacted liner, daily cover and for final cover. Smaller quantities may be used for construction of levees, temporary berms, and general improvements to grading. Granular materials needed for the leachate collection system and for granular filters may be obtained off-site from commercial suppliers. All materials used in the construction of liners or leachate collection system will be evaluated according to the pre-construction material evaluations outlined in Appendix H, Quality Assurance and Quality Control Plan for Liner Construction and Maintenance.

521.B.2. b. location of leachate collection/treatment/removal system.

A detailed description of plans and specifications for Magnolia Sanitary Landfill, which includes the leachate collection system and other design details, is presented in LAC 33:VII.521.F - Facility Plans and Specifications. Additionally, the location of the leachate collection system is presented in Appendix E as Drawing No. 4 - Leachate Collection System Plan. A composite liner system will also be installed in all future cells of the landfill.

521.C. Facility Surface Hydrology. Standards governing facility surface hydrology are contained in LAC 33:VII.711.A (Type I and II landfills).

(Note: All applicable sections of LAC 33:VII.Chapter 7 were addressed and incorporated into the responses presented below in accordance with LAC 33:VII.521.Part II.)

521.C.1. The following information regarding surface hydrology is required for all facilities:

521.C.1. a. a description of the method to be used to prevent surface drainage through the operating areas of the facility;

A letter from the COE, dated May 4, 1984, stated that a 100-year flood in the vicinity of the site would produce a stage of approximately 66.8 feet NGVD and the highest observed stage at the site was 66.4 feet NGVD. Typical ground surface elevations ranged from 61 to 64 feet NGVD. A letter requesting confirmation of this elevation has been filed with the COE. Copies of this correspondence are presented as Exhibit C.1.

Correspondence from the COE dated October 24, 1984 indicated that the site would have a negligible impact on the Bayou Lafourche flood stage. This letter also indicated that fill material placed at this site would cross a natural depression that drained an auxiliary outlet of Gourd Bayou, and that blockage or significant encroachment into this floodway could raise flood stages upstream. This was further discussed in the January 25, 1985 COE correspondence which reiterated this information, and provided sizing and maintenance suggestions for the facility perimeter ditch. Copies of the October 24, 1984 and January 25, 1985 letters are presented as Exhibits C.2 and C.3, respectively.

Currently, the COE recognizes the information provided by the Federal Emergency Management Agency (FEMA) to be the authoritative source regarding floodplain determinations. Flood hazard areas as determined by FEMA are produced on the FEMA "Flood Insurance Rate Maps". A copy of the FEMA maps for Ouachita Parish were obtained from the Louisiana Department of Transportation and Development. Based on the information provided by the FEMA map encompassing the site (Community-Panel Number 220135 0125 A, dated July 2, 1980), the landfill is located in the flood hazard area designated as "Zone A6" and thus is located in the 100-year floodplain. (Note: "Zone A6" represents an area of 100-year flood where base flood elevations (66.8 feet NGVD for the site) and flood hazard factors have been determined). A copy of the FEMA map showing the flood hazard areas in relation to the existing landfill site and the surrounding areas is presented as Exhibit C.4.

Preconstruction ground elevations at the site ranged from 61 to 64 feet

NGVD with a 100-year flood having a stage of 66.8 feet NGVD. A perimeter flood protection levee exists around the entire landfill, the top of which is at least two feet above (minimum 68.8 feet NGVD) the established 100-year flood elevation. The levee also prevents any migration of leachate or surface water from the active landfill area onto adjacent areas.

In response to COE concerns regarding floodway blockage or encroachment and other drainage concerns including those of the DWF regarding the Russell Sage Wildlife Management Area, several improvements were made to the site, the adjacent land, and to the existing drainage. Prior to any development, the site and surrounding area were poorly drained by Gourd Bayou which, at one time, passed through the site and then proceeded southeast to Bayou Lafourche (See Exhibit B.1). As a result, man-made improvements to the drainage system at the site and in the site area included the protective levee system, the perimeter ditching system, channelization of Bayou Lafourche and Gourd Bayou Improved which is now located to the west of the landfill. As a result of these improvements, the majority of site and local runoff has been diverted through this drainage system.

Presently, the area north and west of the landfill drains directly into Gourd Bayou Improved (which has been channelized south and east to a point where it joins the original channel of Gourd Bayou). This portion of Gourd Bayou and Gourd Bayou Improved empties into Youngs Bayou approximately two and three-fourths (2 3/4) miles downstream of the site. Drainage of the area east and southeast of the site is generally southeast along the abandoned Gourd Bayou channel and other small tributaries, eventually flowing into Bayou Lafourche which is located approximately three miles east of the site. These drainage patterns do not affect the positive drainage pattern to Bayou LaFourche and results in many undrained sloughs and depressions which are utilized as wildlife habitat in the Russell Sage Wildlife Management Area (WMA). Local wildlife officials have stated that this drainage pattern was consistent with their projected use of the land comprising the wildlife management area and that no additional drainage was desired through this area (See Exhibit A.7). The perimeter surface water ditch system drains generally west around the entire landfill facility to Gourd Bayou Improved thus assuring that no small areas of adjacent runoff are blocked and no small areas of runoff are diverted through the abandoned Gourd Bayou channel into the Russell Sage WMA. Additionally, after final cover has been placed on any section of the facility, that section will be vegetated to prevent erosion and silt build-up. Runoff from the final covered areas will flow over the perimeter flood control levee into the outside drainage ditch to the facility sedimentation pond and to Gourd Bayou Improved.

The site's perimeter flood levee will remain in place and will protect the landfill operation from a 100-year flood and from the potential of washout from a flood of this magnitude. The site's perimeter surface water ditch system is designed to handle the peak discharge from a 25-year, 24-hour storm event following closure of the landfill, which is when the peak discharge from this event will be at a maximum due to the presence of the closure cover thus meeting the recommendations of the COE. In addition, the perimeter ditches are periodically inspected and maintained as needed. The calculations for sizing the surface water drainage system are presented in Appendix E.

521.C.1. b. a description of the facility runoff/run-on collection system;

A perimeter levee exists around the active landfill area to a minimum elevation of 68.8 feet NGVD to prevent encroachment of the 100-year flood. This levee also prevents flow onto the active landfill area from a 25-year, 24-hour storm. The exterior slope of the levee forms one side of the surface water perimeter drainage ditch system, which is designed to handle the peak discharge from a 25-year, 24-hour storm event following closure of the landfill, which is when the peak discharge from this event will be at a maximum due to the presence of the closure cover. The calculations for sizing of the surface water drainage system are presented in the RUST E&I report presented in Appendix E.

Facility operations incorporate the use of culverts, pumps, pipes and hoses in conjunction with grading of areas outside the excavation and/or active disposal areas for surface water management during site development. Water collected may be directed to the perimeter drainage system as required for the control of facility surface water run off/run-on.

Technical Paper No. 40 issued by the U.S. Weather Bureau indicates that a rainfall of 24-hour duration for a 25-year frequency in the Monroe area would equal 8 inches. This is the rainfall depth that was originally considered in the design of the drainage facilities for this site. However, in accordance with LAC 33:VII.711.A.3, Magnolia Sanitary Landfill is located above latitude 31° North and, therefore, the design standard rainfall of 9 inches was used in the revised design of drainage facilities for this site.

The exterior levee slopes and the drainage system around the landfill are inspected following major storm events for evidence of erosion and other potential problems. Any areas that have experienced significant erosion are repaired and ditch areas that are not draining properly are cleared to allow adequate drainage. Erosion control measures will be implemented, if needed, for any areas that experience recurring erosion problems.

Areas under construction or sections of the landfill with at least two feet of interim cover are graded such that surface water drains toward temporary drainage and diversion ditches and then to the sedimentation pond located near the northwest corner of the landfill. (Note: If necessary, cell excavations under construction are pumped out using portable pumps). The surface water collected is temporarily retained in this pond to encourage settlement of suspended solids prior to discharge. The pond and perimeter levee ditch discharge to the man-made improvements to the natural drainage feature (Gourd Bayou Improved) located near this area at the landfill perimeter. Discharge leaving the site is monitored in accordance with the site LPDES permit (See Appendix Q).

Runoff from areas to which less than two foot of soil has been applied is considered "contact water" and is prevented from mixing with runoff in construction excavations. This contact water is collected in the leachate collection system and then routed to the oxidation pond via the forcemain or tanker trucks. Runoff collected in the leachate collection sumps is pumped into the forcemain or trucked to the oxidation pond where it is treated and then routed to the sedimentation pond.

The leachate collection system is designed to prevent the accumulation of more than one foot of leachate in the bottom of an active cell, which is the equivalent to the nine inch design standard rainfall. For overflow of leachate (or contaminated runoff from an active area) to occur, several feet of rainfall would have to accumulate in the bottom of a cell. This could not occur because the pump in the sump begins removing leachate as soon as the level sensors turn the pump on (at a level below one foot).

Some stormwater collected within the disposal area is pumped directly to the oxidation pond, prior to entering the leachate collection system, utilizing portable pumps, hoses and/or pipes. Non-contact water (ordinary runoff and water from excavations) is diverted to temporary sumps or ditches and routed to the facility's sedimentation pond.

The disposal area of the landfill is progressively being filled, covered, and shaped to facilitate drainage. During above-grade waste placement, the height of the temporary containment berm, if utilized will be increased, as needed, as the height of the waste increases, until the adjacent cell is completely constructed and ready to receive waste. This prevents contaminated run-off from the active subcell from entering any subcell(s) under construction. Run-off collected inside the above-grade active disposal area will be directed to a low area and pumped directly, prior to entering the leachate collection system to the oxidation pond(s) via the forcemain, temporary pumps and hoses, or tanker truck utilizing portable pumps, hoses and/or pipes for treatment.

A small natural drainage channel (the former Gourd Bayou channel) previously entered the landfill site along the north side of the site and then traversed the middle of the site. This channel has been relocated to flow around the perimeter of the site and is now referred to as Gourd Bayou

Improved. Stormwater run-on from the adjacent property north of the facility will be redirected in a surface water diversion ditch along the northern property line to the northwest corner of the site to Gourd Bayou Improved. Additionally, the surface water diversion ditch will reasonably prevent the co-mingling of facility surface water run-off and off-site surface water run-on. The approximate location of the surface diversion ditch and detail are shown on Drawings Nos. 2, 3, 5 and 12. The treated oxidation pond effluent and surface water runoff from the site are discharged from the sedimentation pond into Gourd Bayou Improved.

521.C.1. c. the maximum rainfall from a 24-hour/25-year storm event;

Technical Paper No. 40 issued by the U.S. Weather Bureau indicates that a rainfall of 24-hour duration for a 25-year frequency in the Monroe area would equal 8 inches. This is the rainfall depth that was originally considered in the design of the drainage facilities for this site.

However, in accordance with LAC 33:VII.711.A.3, Magnolia Sanitary Landfill is located above latitude 31° North and, therefore, the design standard rainfall of 9 inches was used in the revised design of drainage facilities for this site. The surface water drainage ditch system is designed to handle the peak discharge from a 25-year, 24-hour storm event following closure of the landfill, which is when the peak discharge from this event will be at a maximum due to the presence of the closure cover. The calculations for sizing of the surface water drainage system are included in the RUST E&I report presented as Appendix E.

521.C.1. d. the location of aquifer recharge areas in the site or within 1,000 feet of the site perimeter, along with a description of the measures planned to protect those areas from the adverse impact of operations at the facility; and

Two state geologic maps were reviewed to determine the location of aquifer recharge areas including the "Aquifer Recharge Potential of the Shreveport Quadrangle", Map #5 (1988) and the adjoining map entitled "Aquifer Recharge Potential of the Jackson Quadrangle", Map #6 (1988). These maps indicate that Magnolia Sanitary Landfill is not located in an area which recharges a major Louisiana aquifer system or within 1,000 feet of an aquifer recharge zone.

Adverse impacts to recharge areas due to operations at Magnolia Sanitary Landfill are not anticipated since the landfill is located in an area that does not recharge major Louisiana freshwater aquifers and because of the protective liner system which has been utilized at the landfill. The landfill is designed to include a composite liner system (low permeability clay overlain by a HDPE liner) to provide maximum environmental protection.

Additionally, shallow groundwater beneath the landfill is properly monitored for the purpose of detecting any adverse impacts to the shallow groundwater. The monitor well network provides an effective "early warning system" such that, if any problems are detected or otherwise anticipated, contingencies can be immediately implemented to address those areas of concern.

521.C.1. e. if the facility is located in a flood plain, a plan to ensure that the facility does not restrict the flow of the 100-year base flood or significantly reduce the temporary water-storage capacity of the flood plain, and documentation indicating that the design of the facility is such that the flooding does not affect the integrity of the facility or result in the washout of solid waste.

Magnolia Sanitary Landfill is located in a 100-year floodplain. However, correspondence from the COE indicates that the facility does not significantly reduce the temporary water-storage capacity of the floodplain. As discussed in the response to LAC 33: VII.521.C.1.a of this Section, a letter from the COE, stated that a 100-year flood in the vicinity of the site would produce a stage of approximately 66.8 feet NGVD and the highest observed stage at the site was 66.4 feet NGVD. Typical ground surface elevations ranged from 61 to 64 feet NGVD.

As described in the response to LAC 33:VII.521.C.1.a of this Section, a perimeter levee has been constructed around the active landfill area to a minimum elevation 68.8 feet NGVD to prevent encroachment of the 100-year flood. This levee also prevents flow onto the active landfill area from a 25-year, 24-hour storm. The COE determined that a landfill at the location of Magnolia Sanitary Landfill would not significantly reduce the temporary water storage capacity of the flood plain (See Exhibits C.1 through C.3). The site's perimeter flood levee will remain in place and will protect the landfill operation from a 100-year flood and from the potential of washout from a flood of this magnitude.

In accordance with LAC 33:VII.521.Part II, the applicable sections of LAC 33:VII.713 Standards Governing Surface Impoundments were incorporated into the above responses. However, to maintain clarity and continuity, the following summary is provided to specifically address Magnolia Sanitary Landfill's surface impoundments (Aerated Lagoons or oxidation ponds):

Although the existing oxidation pond is located within the facility flood protection levee, a perimeter levee was constructed around the pond as a precautionary measure to a minimum elevation of 68.8 feet NGVD. Therefore, the oxidation ponds will be adequately protected by two perimeter levees (facility and individual pond) which provide a two-foot freeboard above the 100-year flood elevation of 66.8 feet NGVD.

The oxidation ponds (lagoons) designs are shown in the ERI Environmental Services' report, "Aerated Lagoon Design, Magnolia Sanitary Landfill" presented in Appendix R. The design provides for the collection of drainage from units which have not received final cover during a 24-hour/25-year storm event. Adequate freeboard to prevent over-topping by wave action is provided by the existing levee for each pond. The oxidation ponds will be equipped with a high-pressure pump connected to a Leachate Recirculation Header, which will allow for the connection of flexible hoses and portable sprinklers. The sprinklers will be used to recirculate the leachate over active areas of the landfill as described in the Facility Operations Plan and in the response to LAC 33:VII.521.F.4.c.

As previously discussed in the response to LAC 33:VII.521.C.1.e., Magnolia Sanitary Landfill is located in a 100-year floodplain; however, the facility does not significantly reduce the temporary water-storage capacity of the floodplain. As previously discussed in LAC 33:VII.521.C.1.a., a letter from the U.S. Army Corps of Engineers (COE), stated that a 100-year flood in the vicinity of the site would produce a stage of approximately 66.8 feet NGVD and the highest observed stage at the site was 66.4 feet NGVD. A perimeter flood protection levee exists (minimum elevation 68.8 feet NGVD) around the entire facility which is at least two feet above the established 100-year flood elevation. In the event of a 100-year flood, the flood protection levee will ensure that flooding does not affect the integrity of the facility or result in the washout of solid waste so as to pose a threat to human health and the environment.

As previously discussed in the response to the LAC 33:VII.521.C.1.b., the perimeter ditch system at Magnolia Sanitary Landfill is designed to accommodate the discharge from the 25-year storm event. The calculations for sizing of the surface water drainage system are presented in the Rust E&I report presented in Appendix E.

It should be noted the facility's existing surface impoundments (e.g., existing sedimentation pond and existing connecting earthen ditch, and existing oxidation ponds) are not required to comply with any of the requirements of LAC 33:VII.713.A.3, 4, and 5. However, the information provided in the above responses indicates the systems are in compliance with applicable requirements. Magnolia Sanitary Landfill understands that LAC 33:VII.713.A.6. does not relieve the facility from compliance with the Louisiana Water Quality Regulations (LAC 33:Part IX).

521.D. Facility Geology. Standards governing facility geology are contained in LAC 33:VII.709.C (Type I and II facilities).

(Note: All applicable sections of LAC 33:VII.Chapter 7 were addressed and incorporated into the responses presented below in accordance with LAC 33:VII.521.Part II.)

521.D.1. The following information regarding geology is required for Type I and Type II facilities:

521.D.1. a. isometric profile and cross-sections of soils, by type, thickness, and permeability;

An isometric profile and geologic cross-sections of the soils present beneath the site by type, thickness and permeability (vertical and horizontal) were prepared by RUST E&I and are included in the report presented as Appendix E. A summary of the geotechnical findings of the investigation conducted by RUST E&I at Magnolia Sanitary Landfill is presented in this report in Sections 4 and 6. The isometric soil profile was constructed from selected soil borings installed by RUST E&I (1993 and 1996) and SWL (1984) and is represented on Figure 7 and the site geologic cross sections which are represented on Figures 8A through 8E of this report.

The Magnolia Sanitary Landfill site is predominantly underlain by four soil strata to the maximum depth explored of 100 feet bgs. Beginning at the ground surface, a thick layer of competent, highly plastic and relatively low permeability clay (CH) soils were identified to approximately 15 feet bgs (Stratum IA) underlain by a silty clay-clay (CH-CL) layer between 15 and 30 feet bgs (Stratum IB). In isolated areas beneath the facility, a saturated 2 to 5-foot thick layer of predominantly clayey silt (ML) was encountered at a depth of 15 to 20 feet bgs (Stratum II). An isopach map depicting the areal distribution of Stratum II is included as Figure 13. This figure also indicates where Stratum II and Stratum III merge together (Stratum II/III, locations marked in red). Beneath these strata is a saturated silty sand to sand (SM-SP) unit (Stratum III) to a depth of approximately 70 to 75 feet bgs. These strata (Strata III and II/III) represent the Uppermost Aquifer which exists beneath the site. A soft to very stiff marine clay (Stratum IV) underlies this unit in it's entirety beneath the facility and is consistent with the Cook Mountain formation (Claiborne group) of Tertiary geologic age. This stratum represents the lower confining unit.

521.D.1. b. logs of all known soil borings taken on the facility and a description of the methods used to seal abandoned soil borings;

Subsurface investigations were conducted by Southwestern Laboratories (SWL) in 1984 and by RUST E&I in 1993 and 1996 as part of the permitting process to assess the subsurface conditions beneath the site for suitability as a solid waste disposal site and for providing support of the landfill units. All available soil boring logs have been included with this document. The SWL boring logs are provided in Appendix V and the RUST E&I boring logs are provided in Attachment B.1 of Appendix E. These investigations conformed to the regulations governing municipal solid waste landfills that were in effect at the time that each was performed. The RUST E&I investigation was conducted in accordance with the provisions specified in LAC 33:VII.521.D.1; 521.E.1; and 709.C.1 of the LSWRR. During June and July 1993, 41 boreholes were drilled for a geotechnical investigation conducted by RUST E&I. This investigation included the installation of four exploratory borings completed to a depth of approximately 100 feet below ground surface (bgs). These borings were sampled continuously to 50 feet bgs and on five-foot centers thereafter to completion. Additionally, 37 soil borings were completed to a depth of 50 feet bgs and sampled continuously to total depth. During January and February 1996 nine additional boreholes were drilled by RUST E&I as part of a supplementary hydrogeological site investigation. This investigation included the installation of eight exploratory soil borings to depths ranging from 18 to 33 feet bgs. The ninth soil boring, PZ-12 was installed to a depth of 86 feet bgs. All nine soil borings were sampled continuously to total depth. During May 1996, eight piezometers (two nests) were installed near MW-06 and R-33, respectively. The screened interval for each piezometer was sampled. In the field, all samples were visually classified in general accordance with the Unified Soil Classification System (approximately equivalent to ASTM D-2488). The boring logs containing strata descriptions, sample depths, laboratory test results, the depth first water was encountered, location coordinates, and Unified Soil Classifications are also presented in Attachment B of the RUST E&I report (Appendix E).

Cohesive soil samples were collected for geotechnical testing using a thin-walled Shelby tube sampler in accordance with ASTM D-1587. Non-cohesive samples were collected using a two-inch diameter split-spoon sampler utilizing the procedure outlined in ASTM D-1586 for standard penetration testing. Additional geotechnical testing included unconfined compression tests (ASTM D-2166), unconsolidated-undrained triaxial compression tests (ASTM D-2850), Atterberg limits (ASTM D-4318), moisture content (ASTM D-2216), dry density (U.S. Army COE: EM 1110-2-1906, Appendix II), gradation (ASTM D-422 and D-1140), consolidation (ASTM D-2435), and permeability (ASTM D-5084). The results of geotechnical testing are included in Attachment C of Appendix E.

In addition, 45 boreholes were previously drilled to a depth of 45 feet bgs by SWL in 1984 as part of the initial site investigation. The 45 exploratory borings were installed on an approximate 450-foot by 450-foot grid spacing across the site. The borings installed by SWL were either sampled continuously or on five-foot centers to a depth of 26 feet below ground surface and on five-foot centers thereafter to completion. The boring logs from the SWL investigation are included in Appendix V, and a detailed summary of the SWL geotechnical investigation is included in Section 2.2.1 of the RUST E&I report (See Appendix E). The approximate locations of all soil borings installed during these geotechnical investigations are shown on Figure 1 of Appendix V, as well as Figure 3 and Drawing No. 2 of the RUST E&I report presented in Appendix E.

The groundwater flow conditions at the Magnolia Sanitary Landfill were based upon the geotechnical/hydrogeological investigation by RUST E&I in 1993 and a supplemental hydrogeological investigation of the site by RUST E&I in 1996. Assessment activities included the installation of piezometers within Stratum II and Stratum III adjacent to existing monitor wells installed within Stratum III to determine the horizontal and vertical flow regime at the site in order to develop a conceptual flow net. This information was evaluated to determine the optimum groundwater monitoring network to effectively monitor downgradient of the facility to detect a potential release and is included in the RUST E&I report included in Appendix E.

Each RUST E&I soil boring was appropriately plugged and abandoned with a Portland Type I cement and 5 percent bentonite gel grout in accordance with LDEQ and LDOTD regulations. The grout was thoroughly mixed then weighed using a calibrated mud balance. When the appropriate weight and consistency were reached, the grout was pumped to the bottom of the borehole through a tremie pipe so that any remaining drilling fluid was displaced to the ground surface. The return grout was also weighed until the initial pump weight was reached. The soil borings completed in 1984 by SWL were grouted with a cement grout to near surface and backfilled, as noted in the original permit application document.

521.D.1. c. results of tests for classifying soils (moisture contents, Atterberg limits, gradation, etc.), measuring soil strength, and determining the coefficients of permeability, and other applicable geotechnical tests;

The results of tests to classify soils, measure soils strength and determine coefficients of permeability and other applicable engineering properties are detailed in Appendix E of the above referenced RUST E&I geotechnical study.

521.D.1. d. **geologic cross-section from available published information depicting the stratigraphy to a depth of at least 200 feet below the ground surface;**

A geologic cross-section, representative of the area of Magnolia Sanitary Landfill, to a depth of at least 3,000 feet below ground surface beneath the site is presented as Exhibit D.1. Additionally, site specific geologic cross sections are presented in the RUST E&I report (See Appendix E - Figures 7, 8A, 8B, 8C, 8D, and 8E).

521.D.1. e. **for faults mapped as existing through the facility, verification of their presence by geophysical mapping or stratigraphic correlation of boring logs. If the plane of the fault is verified within the facility's boundaries, a discussion of measures that will be taken to mitigate adverse effects on the facility and the environment;**

As demonstrated in the responses to LAC 33:VII.521.A.2.b, faults are not known to be present within the boundaries of the facility or within 200 feet of the facility perimeter. Therefore, measures are not necessary to mitigate adverse effects of faulting on the facility.

521.D.1. f. **for a facility located in a seismic impact zone, a report with calculations demonstrating that the facility will be designed and operated so that it can withstand the stresses caused by the maximum ground motion, as provided in LAC 33:VII.709.C.2; and**

Louisiana (and the area of the site) is not located within a seismic impact zone. According to LAC 33:VII.115, a seismic impact zone is defined as "an area with a 10 percent or greater probability that the maximum horizontal acceleration in lithified earth material, expressed as a percentage of the earth's gravitational pull (g), will exceed 0.10 g in 250 years."

Presented as Exhibit D.2 is the map entitled "USGS Miscellaneous Field Studies Map MF-2120; Probablistic Earthquake Acceleration and Velocity Maps for the U.S. and Puerto Rico" published by the U.S. Geological Survey (Algermisson, S.T., et al., 1990). This map contains contours corresponding to the percent probability that the maximum horizontal acceleration in lithified earth materials, expressed as a percentage of the earth's gravitational pull (g), will occur within 250 years. As indicated in Exhibit D.2, the site vicinity is located in an area (northeast Louisiana) designated as having an earthquake of magnitude 0.06 g within 250 years. Therefore, since the probability is less than 10 percent that an earthquake of magnitude 0.10 g will occur at the site, an evaluation of structural impact caused by ground motion is not required.

521.D.1. **g.** **for a facility located in an unstable area, a demonstration of facility design as provided in LAC 33:VII.709.C.3.**

Geotechnical testing of samples collected during the subsurface exploration programs conducted by SWL and by RUST E&I indicated that the site is underlain by stable earth materials. There are no known on-site or local soil conditions, geological conditions, geomorphologic features, or human-made features or events that would contribute to significant differential settling or instability of the landfill. Mass movement caused by faulting is not anticipated based on the discussion presented in the previous Sections. Karst terrain does not exist in the vicinity of Magnolia Sanitary Landfill and is not present in at least the upper 3,000 feet of soils underlying the site as shown on the generalized geologic cross section presented as Exhibit D.1.

521.E. Facility Subsurface Hydrology. Standards governing facility subsurface hydrology are contained in LAC 33:VII.715.A (Type I and II landfarms).

(Note: The referenced Chapter 7 Standards for facility subsurface hydrology are not included in this section because they pertain only to landfarms.)

521.E.1. The following information on subsurface hydrology is required for all Type I facilities and Type II landfills and surface impoundments:

521.E.1. a. delineation of the following information for the water table and all permeable zones from the ground surface to a depth of at least 30 feet below the base of excavation:

521.E.1.a. i. areal extent beneath the facility;

Based on the results of site geotechnical investigations (presented in Appendix E), the Magnolia Sanitary Landfill site is predominantly underlain by four soil strata to the maximum depth explored of 100 feet bgs. Beginning at the ground surface, a thick layer of competent, highly plastic and relatively low permeability clay (CH) soils were identified to approximately 15 feet bgs (Stratum IA) underlain by a silty clay-clay (CH-CL) layer between 15 and 30 feet bgs (Stratum IB). In isolated areas beneath the facility, a saturated 2 to 5-foot thick layer of predominantly clayey silt (ML) was encountered at a depth of 15 to 20 feet bgs (Stratum II). An isopach map depicting the areal distribution of Stratum II is included as Figure 13. This figure also indicates where Stratum II and Stratum III merge together (Stratum II/III, locations marked in red). Beneath these strata is a saturated silty sand to sand (SM-SP) unit (Stratum III) to a depth of approximately 70 to 75 feet bgs. These strata (Strata III and II/III) represent the Uppermost Aquifer which exists beneath the site. A soft to very stiff marine clay (Stratum IV) underlies this unit in it's entirety beneath the facility and is consistent with the Cook Mountain formation (Claiborne group) of Tertiary geologic age. This stratum represents the lower confining unit.

521.E.1.a. ii. thickness and depth of the permeable zones and fluctuations;

Based on the investigations completed at the site, there are two water-bearing units beneath the facility. These are Stratum II (uppermost water-bearing permeable zone) which occurs at a depth ranging from approximately 15 to 30 feet bgs or 53 to 38 ft NGVD, and Stratum III (Uppermost Aquifer) which occurs from approximately 30 to 75 feet bgs or 38 to -17 ft NGVD.

The thickness of Stratum II ranges from approximately 2 feet to 5 feet where encountered in the north and northeast portions of the site but increases in thickness in southern portions of the site to a maximum of 16 feet. Based on the data available, the thickness of Stratum III ranges from 37 feet at soil boring R-13 to 55 feet at soil boring R-33, but is typically between 40 and 45 feet thick. The variation of thickness in Stratum II is indicated on the isopach map presented as Figure 13 of the RUST E&I report in Appendix E. This figure also indicates where Stratum II and Stratum III merge together (Stratum II/III, locations marked in red). Where the units merge, the combined strata represent the Uppermost Aquifer beneath the surface in that area of the facility. The thickness and depth of Strata II and III are graphically presented in the isometric soil profile (Figure 7) and cross sections (Figures 8A through 8E).

521.E.1.a. iii. direction(s) and rate(s) of groundwater flow based on information obtained from piezometers and shown on potentiometric maps; and

Soil Testing Engineers, Inc. (STEI) installed nine groundwater monitor wells, designated MW-01 through MW-09, in 1985. Each of the wells, ranging in depth from 35 to 53 feet bgs, were screened from approximately 38.5 ft NGVD to 20.25 ft NGVD, and in the same water-bearing silty sand to sand (SM-SP) zone (Stratum III). This groundwater monitoring well network provided data for utilization in the development of potentiometric maps which indicate the groundwater flow direction across the facility.

RUST E&I installed fourteen piezometers, designated PZ-10, 11, 12, 14, 15, 16, 17A-D, and 18A-D during 1996. These piezometers were installed to meet current regulatory requirements, and also provided additional hydrogeologic data for the site. Five of the piezometers, ranging in depth from 18 to 28 feet bgs, were screened in the top of Stratum II (predominantly ML) from approximately 13 to 28 feet bgs (50 to 34 feet NGVD). The remaining nine piezometers were installed within the sand and gravel portions of Stratum III from approximately 36 to 86 feet bgs (27 to -23 feet NGVD). Soil boring logs and piezometer construction summaries are included as Attachments B.1 and B.2, respectively, in the RUST E&I report in Appendix E. The monitor wells and piezometers are shown on the Isometric Soil Profile (Figure 7) and cross-sections (Figures 8A through 8E) in Appendix E.

In brief, the Uppermost Aquifer beneath Magnolia Sanitary Landfill occurs at a depth ranging from approximately 15 to 30 feet below ground surface (bgs) to at least 75 feet bgs. Historical groundwater levels were obtained from the nine onsite groundwater monitoring wells since 1987. A review of the historical groundwater elevation data indicated that the static groundwater levels fluctuated between approximate potentiometric elevations of 47 and 56 feet NGVD since 1987. In general, the potentiometric surface exhibits an increase in elevation during the spring, due to heavy rainfall and local flooding, and is influenced by the nearby Bayou Gourd. The groundwater flow direction appears to maintain a south/southeasterly direction, with a gradient ranging between 0.0005 and 0.001 feet/foot, even during periods of local flooding. Based on this hydraulic gradient, an effective porosity for silt to sandy silt of 0.15, groundwater velocity within the Stratum II soils was computed to be approximately 1 foot per year. Similar calculations were conducted for Stratum III data, utilizing a geometric mean for hydraulic conductivity of 5.18×10^{-3} cm/sec (14.67 ft/day), the hydraulic gradient range between 0.0005 and 0.001 ft/ft and an effective porosity for sand of 0.25. The resulting groundwater velocity in Stratum III was computed to range between 11 and 21 feet per year. A table presenting the historical groundwater data (Table 2) and potentiometric maps illustrating the groundwater flow direction (Figures 9A through 9F) are presented in the RUST E&I report included in Appendix E and in Appendix V.

The delineation of groundwater flow conditions at the Magnolia Sanitary Landfill was based upon the geotechnical/hydrogeological investigations by RUST E&I in 1993 and 1996. Assessment activities included the installation of piezometers within Stratum II and Stratum III adjacent to existing monitor wells installed within Stratum III to determine the horizontal and vertical flow regime at the site in order to develop a conceptual flow net. This information was evaluated to determine the optimum groundwater monitoring network to effectively monitor downgradient of the facility to detect a potential release, and is included in the RUST E&I report included as Appendix E.

521.E.1.a. **iv.** **any change in groundwater flow direction anticipated to result from any facility activities.**

A change in groundwater flow direction is not anticipated from any facility activities or the operations at Magnolia Sanitary Landfill. Changes in flow direction have not been observed to date at the site. Verification can be provided by referencing the Semi-Annual Groundwater Monitoring Reports submitted to the LDEQ-Solid Waste Division.

521.E.1. **b.** **delineation of the following, from all available information, for all recognized aquifers which have their upper surfaces within 200 feet of the ground surface:**

521.E.1.b. **i.** **areal extent;**

521.E.1.b. **ii.** **thickness and depth to the upper surface;**

521.E.1.b. **iii.** **any interconnection of aquifers; and**

521.E.1.b. **iv.** **direction(s) and rate(s) of groundwater flow shown on potentiometric maps.**

A review of the Water Resources of Ouachita Parish, Louisiana, Water Bulletin No. 14, Department of Conservation, Louisiana Geological Survey and Louisiana Department of Public Works, Baton Rouge, Louisiana, 1972, reveals that fresh groundwater occurs in Ouachita Parish in unconsolidated deposits of Eocene, Pleistocene and Holocene ages. The Claiborne group of Eocene age provides most of the fresh groundwater supplies for this area. The alluvium, which ranges in age from Pleistocene to Holocene, forms the youngest water-bearing unit in the area.

The Cook Mountain Formation is a primary source of water for domestic wells in Ouachita Parish. This formation, which ranges from 150 to 200 feet in thickness, is made up of clays, silty clays, marls, and fine-grained glauconitic sands. Clay and silty clay form the bulk of the unit; sands irregularly occur aerially and vertically within the unit. The sands in the Cook Mountain are discontinuous and of limited areal extent. A number of wells east of the Ouachita River are screened in the Cook Mountain Formation. The stratigraphic position of the intervals indicates that the sands are uppermost Sparta or lowermost Cook Mountain. The Cook Mountain is developed in the eastern part of the parish as the most economical source of soft water for domestic users. Yields of more than 20 gpm are possible at some localities, but the discontinuity of the sands indicate that sustained yields at higher rates are improbable (Ref.: Water Resources of Ouachita Parish, Louisiana, Water Resources Bulletin No. 14).

Regionally, the alluvium of the Ouachita River is developed as a source of water for stock, irrigation, and industrial uses. This unit is not typically developed for domestic consumption due to poor water quality. As previously mentioned, the alluvium forms the youngest (shallowest) aquifer in the area; however, the alluvium is thick enough to be considered a significant source of water only beneath the Ouachita valley. At the site, where Stratum II and Stratum III merge, the Uppermost Aquifer is encountered within approximately 15 to 20 feet of ground surface. In general, the alluvial deposits have basal gravel overlain successively by sand, silt, and clay. The surface of the alluvium is relatively flat. Land-surface elevations are as high as 80 feet along the natural levees of the Ouachita River. The surface slopes gently from the crest of these natural levees toward swamps that have elevations of 55 to 65 feet. The base of the alluvium, on the other hand, is very irregular since it rests on the eroded surface of the Cook Mountain Formation. Because of irregularities in the base of the alluvium, the thickness changes rapidly in short distances and ranges from 15 to 50 feet.

Regionally, the movement of groundwater is principally toward the area of the Mississippi structural trough and the Gulf Coast geosyncline. The direction is generally in a south to southeast flow. Shallower surface topography generally affects this water and the flow is toward Bayou Lafourche and the south.

A review of the "Aquifer Recharge Potential of the Shreveport Quadrangle", Map #5 (1988) and the "Aquifer Recharge Potential of the Jackson Quadrangle", Map #6 (1988), of the Aquifer Recharge Atlas, Louisiana Geological Survey and review of the Geologic Map of Louisiana (1984), Louisiana Geological Survey, indicates that the site is located in an area that does not recharge to an underlying major Louisiana fresh water aquifer system. Aquifer recharge potential was evaluated based on the shallow soil conditions occurring within six feet of the ground surface.

521.F. Facility Plans and Specifications. Standards governing facility plans and specifications are contained in LAC 33:VII.711.B (Type I and II landfills). Standards for groundwater monitoring are contained in LAC 33:VII.709.E. (Type I and II facilities).

(Note: All applicable sections of LAC 33:VII.Chapter 7 were addressed and incorporated into the responses presented below in accordance with LAC 33:VII.521.Part II.)

521.F.1. Certification - The person who prepared the permit application must provide the following certification:

"I certify under penalty of law that I have personally examined and I am familiar with the information submitted in this permit application and the facility as described in this permit application meets the requirements of the Solid Waste Rules and Regulations. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment."

The landfill design drawings, specifications, and operations described in this permit modification have been prepared by, or under the direct supervision of Mr. Dale Steib, a Professional Engineer registered in the State of Louisiana. Certification by Mr. Steib is presented in Appendix D.

The landfill design drawings, specifications, and operations described in this permit modification have been prepared by, or under the direct supervision of Ms. Terri Richardson, a Professional Engineer registered in the State of Louisiana. Certification by Ms. Richardson is presented in Appendix D. The landfill design drawings prepared by RUST E&I and presented in Appendix E are also certified by Ms. Richardson.

Certification by registered engineer Terry D. Denmon, dba Terry D. Denmon & Associates was provided on the original landfill design drawings submitted to the LDEQ in 1985 (these drawings are not included in this submittal since they are already on file with the LDEQ). A certification by Terry D. Denmon for the original permit application is presented in Appendix D.

Southwestern Laboratories performed a geotechnical investigation of the site in 1984. Certification by Southwestern Laboratories was presented in their geotechnical documents which were submitted to the LDEQ as part of the original permit submittal in 1985. A copy of the certification by Southwestern Laboratories for the original geotechnical work performed for the permit application is presented in Appendix D.

521.F.2. The following information on plans and specifications is required for Type I and II facilities:

521.F.2. a. detailed plan-view drawing(s) showing original contours, proposed elevations of the base of units prior to installation of the liner system, and boring locations;

Plan view drawings of the Phase II re-design of Magnolia Sanitary Landfill are shown on Drawings No. 1 and 2 of the RUST E&I report presented in Appendix E. The base of the future landfill cells prior to installation of the liner system is shown in plan view on Drawing No. 2, the Excavation Plan. Note that current liner system requirements did not exist at the time that Cells 1 through 11 were constructed. Contours of the original ground surface are shown on Drawing No. 1 in Appendix E. The ground surface of the landfill area was originally at approximately elevation 62 feet NGVD. The Phase I Cells (1 through 11) were filled prior to the Subtitle D requirements. The final cover in these areas will be retested prior to the placement of the of the HDPE membrane for all parameters in the "Quality Control Plan for Liner Construction and Maintenance" as Presented in Appendix H. The area will also be surveyed of bored to make sure at least three (3) feet of clay is present. A plan view showing the locations of all known borings drilled on site is presented on Drawing No. 1 and Drawing No. 2 in Appendix E. The soil boring logs from the SWL investigation are presented in Appendix V. The logs of the RUST E&I borings are presented in the "Report on the Geotechnical Investigation and Landfill Design, Magnolia Sanitary Landfill", in Appendix E.

521.F.2. b. detailed drawings of slopes, levees, and other pertinent features; and

Typical north-south and east-west cross sections through the entire landfill are shown on Drawings No. 7 and 8 of the RUST E&I report in Appendix E. The original and final grades of the cells are shown on these sections, as well as the perimeter levee. In addition, soils data from boring logs and the typical groundwater level is also indicated on the cross sections.

521.F.2. c. the type of material and its source for levee construction. Calculations shall be submitted demonstrating that an adequate volume of material is available for required levee construction.

A perimeter levee was constructed at the site to a minimum elevation of 68.8 feet NGVD to provide a two-foot freeboard against the 100-year flood level of 66.8 feet NGVD determined by the Corps of Engineers. The levee was constructed of silty clays and clays obtained from shallow borrow excavations within the limits of the landfill. Data on these soils is provided in the RUST E&I report presented in Appendix E. An adequate volume of material was available.

The site's perimeter levee will remain in place and will protect the landfill operation from a 100-year flood and from the potential of washout of solid waste from a flood of this magnitude. The perimeter levees around Magnolia Sanitary Landfill have a grass cover along the outer slopes and the top of levee will be surfaced with gravel to provide proper drainage upon installation of the final closure cover, as shown on the landfill design details (Drawings No. 10, 11, and 12) in Appendix E. The gravel surfacing and grass cover prevent wind and water erosion of the levee.

521.F.3. The following information on plans and specifications is required for Type I, II, and III landfills:

521.F.3. a. the approximate dimensions of daily fill and cover; and

The approximate dimensions of the daily fill area(s) will vary depending upon the location within a disposal cell and current conditions at the time of filling. In general, the daily fill area(s) will be from 8 to 20 feet in height with a sloping working face. The working face will typically measure 5,000 to 10,000 square feet. However, this is not intended to place a limit on the area of the working face. Specific conditions such as number of trucks arriving at any given time will ultimately dictate the daily fill and cover dimensions. A schematic section showing the approximate dimensions of daily fill is provided in Appendix I.

521.F.3. b. the type of cover material and its source for daily, interim, and final cover. Calculations shall be submitted demonstrating that an adequate volume of material is available for daily, interim, and final cover.

Daily cover material consists of on-site soils excavated from within the permitted area or shredded tires mixed with soil to create a homogeneous mixture. The on-site soil material consists of Stratum I (predominantly clays (CH), and silty clays (CL)) and Stratum II (predominantly silts and clayey silts (ML), with some silty clays (CL)). The characteristics of these soils are more than adequate to meet the requirements of this Section for daily and final cover.

Silty clay and clay materials (CL and CH) within Stratum I and Stratum II will also be used in constructing the final cap. This cap, which will have a minimum thickness of 2 feet, will be compacted in loose lifts of approximately 12 inches to ensure proper compaction. Daily and interim cover material used at Magnolia Sanitary Landfill are selected in accordance with LAC 33:VII.711.B.2.a requirements of minimizing vector-breeding areas and animal attraction, controlling leachate generation, minimizing erosion, reducing fire-hazard potential, minimizing blowing paper and litter, reducing noxious odors, and providing accessibility regardless of weather. Materials utilized by the facility include silty or sandy clay from on-site excavations, waste streams with similar characteristics of soil or which provide the previously-listed requirements (i.e. UST-excavated material, pond closure material, or similar industrial wastes), and shredded tires. Shredded tires are delivered from offsite tire processing facilities.

Currently, a portable synthetic daily cover (PSDC) system is also used in lieu of a material cover, and is applied at the end of each operating day. PSDC consists of a series of waterproof panels placed over the working face in a shingle-like fashion. Occasionally, the daily cover used is a silty clay (CL) stockpiled from the on-site excavation or wastes accepted for disposal which provide the characteristics and meet the regulatory performance criteria of daily cover discussed above. Daily material cover, when utilized, are applied a minimum of six inches in thickness at the end of the operating day.

The use of PSDC was previously approved by the LDEQ in a letter dated January 11, 1989. This cover is always available and its performance has been established. Additional alternative daily cover materials are waste streams with characteristics similar to soil or which provide the requirements of daily and interim cover listed in LAC 33:VII.711.B.2.a and b. These materials are commonly used at other facilities around the country as alternative cover material. The PSDC that is generally used for daily cover is accessible regardless of weather conditions. Included in Appendix I is an operational plan for the utilization of alternate daily cover materials and PSDC.

The daily and interim cover is applied in accordance with LAC 33:VII. 711.B.2.b. or a minimum of six inches or one foot thick, respectively and compacted, if appropriate, over the exposed waste area in a manner that discourages animal attraction. The waste is also compacted until very dense, which makes animal entry and harborage difficult.

The daily cover material used at Magnolia Sanitary Landfill is typically soil, shredded tire cover or the PSDC. The PSDC cannot erode, does not allow significant infiltration into the waste since it is virtually impermeable, and does not have a free-liquid content or constituents found in leachate. When soils or shredded tires are used, they are compacted and graded to drain rainfall away from the waste in an effort to minimize infiltration. Materials with significant free-liquid content or concentrations of constituents monitored in leachate are not used for daily cover.

Silty clay material used for interim cover is compacted and graded to drain runoff away from the waste. After placement, the interim cover is seeded and fertilized to establish a grass cover. The grass cover serves to minimize erosion of the interim cover. The interim cover is inspected periodically for erosion and any problems noted are corrected. Materials with free-liquid content or significant concentrations of constituents found in leachate are not used for interim cover.

The fire-hazard potential at the working face of the landfill is minimized by the extensive compaction effort that is performed on the waste and on the cover soils. Good compaction of the waste and cover soils minimizes the inward movement of atmospheric oxygen, therefore reducing the potential for fire to occur. Good compaction of cover soils and/or the installation of the PSDC also inhibits the infiltration of water, which will in turn inhibit decomposition and methane generation.

The daily, interim, and final cover at Magnolia Sanitary Landfill is maintained to enhance aesthetic appearance. The extensive compaction of the waste and cover soils mentioned above and/or the placement of the daily cover minimizes the occurrence of blowing paper and litter. In addition, the area of the working face is limited to minimize problems with litter. Portable litter fences are used, as necessary, to confine litter during periods of high wind. Landfill operations personnel are required to collect and dispose of litter blown from the area of the working face. The interim compacted and final covers are vegetated to minimize erosion and to improve the appearance of the landfill.

The portable synthetic daily cover and the daily and interim cover soils reduce the potential for noxious odors by minimizing the amount of moisture infiltrating into the waste. The waste will decompose at a slower rate with less moisture present and, therefore, methane and other gases will form at a slower rate. This cover also acts as an inhibitor to the movement of gases, which will encourage migration of gas to proceed upward toward a gas vent. The methane gas will be collected from the gas vents and flared to reduce odors.

Accessibility is obtained through temporary all-weather roads that are constructed to provide access to the working face of the landfill. The vegetation established on the interim and final cover helps to maintain the integrity of the cover during wet weather.

Interim cover placed over filled sections of the landfill consists of materials applied a minimum of one foot in thickness. Stormwater runoff from those areas of the landfill on which interim compacted cover or final cover has not been placed (areas having less than two feet of cover material) will be routed either directly to the oxidation pond(s) for treatment or introduced into the leachate collection system.

Magnolia Sanitary Landfill applies a minimum two-foot thick interim compacted cover on areas of the landfill that will not receive waste for at least 60 days. Silty or sandy clays used for interim cover are applied, mechanically compacted, and graded to minimize infiltration of rainfall into the waste. Erosion of this cover is minimized by seeding and fertilizing the cover to promote vegetative cover. Soils used for interim compacted cover will be silty or sandy clay material from on-site excavations or from off-site borrow sources. Clayey soils used for interim cover are generally stockpiled during dry weather at a location that is readily accessible to the area requiring cover. Interim cover will be applied within 48 hours of the last receipt of solid waste in the operating area.

The active disposal area is divided into distinct cells such that the sequence of development will include excavation and construction of a continuous liner system, leachate collection system, levees, berms, and other engineered features of each portion of the landfill. Construction of each cell will be adjacent to a previously constructed cell for the development of the landfill footprint in a continuous manner. A berm will separate cells receiving waste from those under construction. This berm will contain contaminated runoff from cells receiving waste. The height of this berm will be increased, as needed as the height of refuse in the cell increases. It may be necessary to construct and use temporary ramps or roadways in order to allow disposal or construction vehicles access to areas of the landfill which have approached final grade elevations.

Clay borrow material needed during the construction and operation of the facility will be selected from soils obtained during excavation of those cells. Additionally, borrow may be obtained during construction of additional ponds, from adjacent property owned by Waste Management of Louisiana, Inc. or other off-site commercial borrow pits to be identified at a later date. Significant portions of the borrow materials will be used for construction of recompacted liner, daily cover and interim cover and final cover. Granular materials needed for the leachate collection system and for granular filters may be obtained from an off-site commercial supplier. All material, soil and granular, must meet the requirements outlined in the Quality Assurance and Quality Control Plan for Liner Construction and Maintenance, Appendix H.

An estimate of liners, interim cover and final cover materials required for facility operations is presented as Appendix E, "Report on Geotechnical Investigation and Landfill Design," (RUST E&I). Approximately 1,436,000 cubic yards of soil material is required. Daily cover requirements are typically satisfied through utilization of portable synthetic daily cover. An estimate of the volume of select cohesive borrow material provided by remaining on-site excavation was prepared based on the geotechnical information obtained to date. It is anticipated that approximately 1,480,000 cubic yards of soil material is available on-site. The soil-balance calculation indicates a soil surplus of 44,000 cubic yards which will be supplied from the adjacent property or other off-site commercial dirt sources. The capability of the facility to supply this material has been demonstrated by past operations.

521.F.4. The following information on plans and specifications for the prevention of groundwater contamination must be submitted for Type I and II facilities:

521.F.4. a. representative cross-sections and geologic cross-sections showing original and final grades, approximate dimensions of daily fill and cover, drainage, the water table, groundwater conditions, the location and type of liner, and other pertinent information;

Representative cross sections showing original and final grades, and the location of the liner system are presented on Design Drawings No. 1, 5, 7, and 8 in Appendix E. The geologic cross sections showing original grades and typical groundwater levels are also shown on Figure No. 7 and 8A through 8E in Appendix E. Design Drawing No. 5 also shows the direction of flow for surface water runoff around the landfill perimeter. Groundwater flow is to the south and southeast, as indicated on the potentiometric maps presented on Figures 9A through 9F of the RUST E&I report in Appendix E.

Design drawings showing the lines for cells constructed prior to October 9, 1993 were previously submitted to LDEQ and approved. These drawings are not resubmitted in this permit renewal application. The original liner system in Cells 1 through 7 is an in-situ clay liner with the upper six inches recompacted. For cells 8 through 11, the liner system consists of 3 to 4 feet of recompacted low permeability clays.

The liner system for Cells 12 through 25 will consist of a minimum three foot thick recompacted clay liner overlain by a 60-mil HDPE liner. The liner covers the entire floor and side slopes of the excavations. For the vertical expansion in the area of Cells 1 through 11, the existing cap will serve as the clay portion of the liner with the HDPE liner installed over the clay. Sections and details showing the liner system for Cells 1 through 25 are found on Drawing Nos. 11 and 12 in Appendix E.

The approximate dimensions of daily fill and cover are shown in cross section on Figure 12 of the RUST E&I report in Appendix E. The dimensions shown are approximate since the actual volume of waste received each day varies. Perpendicular to the plan of the section, a fill width of 200 feet is common.

521.F.4. b. a description of the liner system, which shall include: calculations of anticipated leachate volumes, rationale for particular designs of such systems, and drawings; and

Cells 1 through 25 at Magnolia Sanitary Landfill received waste after the upgrade date of December 31, 1997 therefore, the LAC 33:VII.711.B.5. standards apply to these cells. The requirements do not apply to waste material in Cells 1 through 11, which received waste prior to the upgrade date. Note that current liner system requirements did not exist at the time that Cells 1 through 11 were constructed. However, a liner system will be installed over existing cover in Cells 1 through 11. The existing cap will serve as the clap portion of the liner system for these cells. Cap thickness will be verified, and the cap will be tested for all parameters in the "Quality Control Plan for Liner Construction and Maintenance" (Appendix H) prior to placement of the HDPE membrane.

Geotechnical investigations at the facility did not reveal any circumstances or geologic site conditions which would warrant special design conditions, the inclusion of secondary liners, or the inclusion of a leak detection system in the design of Cells 12 through 25. The designs of Cells 1 through 11 and the existing oxidation pond currently in operation at Magnolia Sanitary Landfill were previously approved by LDEQ without the inclusion of these special design considerations. The placement of a liner system above Cells 1 through 11 will require the use of special design systems to facilitate leachate removal in this part of the landfill. A toe drain at the intersection of the 25% and 1% liner areas and/or the placement of additional soils meeting the CQA requirements to achieve a positive (minimum 1%) flow path will be installed for more efficient leachate removal.

The liner system design for Cells 1 through 25 at Magnolia Sanitary Landfill includes (from top to bottom) a leachate collection system, a 60-mil HDPE liner, and a minimum three-foot thick recompacted clay liner with a permeability of 1×10^{-7} cm/sec or less. Plan view drawings and cross-sections of this liner system are presented on Drawings No. 3, 4, 7, 8, 11, and 12, in Appendix E. For Cells 1 through 11, the existing clay cap will provide the minimum three-foot thick recompacted clay liner as required by the parameters in the "Quality Control Plan for Liner Construction and Maintenance" (Appendix H). The area will also be surveyed or bored to confirm that a minimum of three (3) feet of clay is present.

The stability of the completed landfill with an increased fill height is discussed in the "Report on the Geotechnical Investigation and Landfill Design, Magnolia Sanitary Landfill" prepared by RUST E&I, presented in Appendix E. This report includes discussions of the stability of clay and synthetic liners on the bottom and slopes of the cells for the completed phase.

Settlement of the base of the landfill was evaluated for the increased height of waste planned for Magnolia Sanitary Landfill, and is also discussed in the "Report on the Geotechnical Investigation and Landfill Design, Magnolia Sanitary Landfill", included in Appendix E. The settlement calculated should not affect the integrity or functioning of the liner and leachate collection system.

Hydrostatic heave was evaluated for the landfill excavation and is also discussed in the RUST E&I "Report on Geotechnical Investigation and Landfill Design", presented in Appendix E. As indicated in this report, hydrostatic heave is not expected to be a problem. The excavation is designed with a factor of safety of 1.1 against hydrostatic heave.

Desiccation of the clay liner is prevented during construction through controlled application of water to the surface of the clay, if needed. After construction, the clay liner is prevented from desiccation by groundwater and surface water infiltration along the edges of the landfill and by the presence of the overlying HDPE liner. The HDPE liner prevents the escape of moisture from the upper surface of the clay liner. Therefore, the base of the excavation is expected to provide maximum resistance to desiccation of the clay liner.

The compacted clay liner will be a minimum of three feet thick across the floor and slopes of each cell. The liner will be constructed using excavated CH or CL material and will be placed directly on the subgrade. If sandy or silty stringers are encountered during construction, the material will be excavated and replaced with a sufficient thickness of additional clay liner material.

The clay liner is constructed in accordance with the following basic specifications:

a) material is selected and approved by the Construction Quality Assurance Engineer as determined by the pre-construction material evaluation. It should be classified according to the Unified Soil Classification System as CL or CH;

b) material is placed in loose lifts nominally 9 inches thick before compaction; and compacted to lifts approximately 6 inches thick;

c) material is compacted to at least 85 percent of the maximum dry density and within a range of moisture contents selected based on laboratory performance (considering "pumping and shrinkage") as determined by the standard Proctor Compaction Test (ASTM D-698);

d) field density and moisture content tests are performed at minimum frequency of 12 per 6-inch lift per acre of compacted material. Locations for tests shall be distributed evenly throughout the fill or selected based on the inspector's judgement; and

e) the saturated coefficient of permeability of the liner is no greater than 1×10^{-7} cm/sec.

The final surface of the clay is graded and proof-rolled to a smooth, uniform surface, generally free from irregularities, depressions, protrusions or other features which may cause ponding or adversely affect the integrity of the synthetic geomembrane to be placed upon it.

Quality control procedures generally include inspection and testing sufficient to determine that the clay fill used for liner construction and the sand and gravel used for leachate collection system construction meets the specifications. The "Quality Assurance & Quality Control Plan for Liner Construction and Maintenance" is presented in Appendix H. Quality control procedures generally include inspection of excavations, monitoring of clay placement, compaction, testing of in-place compacted lifts for density, moisture content, and permeability, documentation of all tests performed, inspection and testing of reworked areas, and verifying liner thickness. These records are included as part of the "record drawing" documentation for each completed section of the cells. Based on the laboratory data of samples obtained from the clay liner, the compacted permeability of the clay must be no greater than 1×10^{-7} cm/sec. The QA/QC plans for liner construction require the QA/QC work to be supervised and certified by a Professional Engineer, registered in the State of Louisiana.

The synthetic liner is a 60-mil HDPE geomembrane installed directly above and in direct contact with the compacted clay liner or existing clay cap that has been tested for all parameters in the "Quality Control Plan for Liner Construction and Maintenance" as Presented in Appendix H.. The geomembrane extends up the side slopes and is anchored in a trench located beyond the crest.

The design of Cells 1 through 25 at Magnolia Sanitary Landfill includes a leachate-collection system designed in accordance with Subsection B.4 of this Section. A complete description of the design of the leachate collection system for Cells 1 through 25 is provided in the responses to LAC 33:VII.521.F.4.c.

The anticipated leachate volume depends on several factors, such as storm intensity and duration, the area of a cell without interim cover, and the amount of waste in a cell. The "worst case" would be a 25-year storm (12 inches of rain within 24 hours) occurring when a cell has a five-foot thick lift of waste but no interim or final cover has been placed.

Anticipated leachate volumes were analyzed using the HELP computer model (Hydrologic Evaluation of Landfill Performance, P.R. Schroeder, et. al., U.S. Army Corps of Engineers Waterways Experiment Station, 1992). The HELP program is a two-dimensional model designed to use climatologic, soils, and design data for a particular cover design and performs a water balance to estimate amounts of runoff, drainage, and infiltration that may be expected with the design. The model analyzed the "worst case" condition consisting of an open cell with a five-foot thick lift of waste over the floor. The volume of leachate was calculated for a one-acre area. The results of this analysis are presented in Appendix J. Based on this analysis, the anticipated leachate volume for an open cell is approximately 1,542 gallons per acre per day.

521.F.4. c. a description of the leachate collection and removal system, which shall include calculations of anticipated leachate volumes, rationale for particular designs of such systems, and drawings.

All cells will receive waste after the upgrade date and, therefore, will be constructed in accordance with these standards.

The leachate collection system for the initial fill areas in Cells 1 through 11 was designed prior to the promulgation of the new requirements for design of these systems. However, these cells do contain leachate collection and removal pipes, and Cells 7 through 11 also contain a sand drainage blanket across the floors of the cells. To date, no problems have been experienced with the leachate collection systems in the modules constructed. The leachate collection system for both the continuation of Cells 1 through 11 and Cells 12 through 25 was designed with the desired performance of maintaining less than 30 cm or one foot of head in the system.

The methods for determining anticipated leachate volume generated from landfill operations including contact stormwater run-off are described in Section 2.3 of the Environmental Remediation, Inc. report entitled "Aerated Lagoon Design, Magnolia Sanitary Landfill," presented in Appendix R. The peak and average daily flows were used to size the leachate treatment pond adjacent to the existing oxidation pond.

The original leachate collection system in Cells 1 through 11 was approved, installed, and is functioning properly. The cells 12 through 25 will have a liner system consisting of a minimum 3-foot thick recompacted clay liner overlain by a minimum 60-mil HDPE liner, which meets the liner requirements of LAC 33.VII.711.B.5. Leachate collection systems, which include collection lines, upslope risers for leachate removal, and sand drainage layers on the cell floors are also included in the revised design. Plan views, cross sections, and details of the design for future cells are shown on the landfill design drawings presented in Appendix E. The leachate collection system for the continuation of cells 1 through 11 will be similar with the existing clay cap serving as the clay liner. The leachate collection system design located above the primary liner, is shown on Drawings No. 4, 9, 10, and 11 in Appendix E.

The leachate collection system for Cells 1 through 25 incorporates a one-foot thick sand drainage layer. As indicated on Drawing No. 10 in Appendix E, a one-foot thick protective cover is provided to trap fines and prevent waste from entering the drainage layer while allowing the passage of leachate. Granular soil or shredded tires may be used to construct the top protective layer of the leachate collection system In lieu of soil, shredded tires, having a permeability greater than or equal to $1x10^{-3}$cm/s, may be used to construct the top protective layer of the leachate collection system. If shredded tires are used in conjunction with a drainage composite, then a minimum one-foot of granular material or soil shall be placed between the shreds and the drainage composite.

Note that flow paths in the sand blanket of Cells 1 through 25 (the re-designed area) will be no more than 100 feet in length, which allows more rapid removal of leachate. The leachate flows on a minimum two percent slope toward protective leachate collection trenches that contain perforated Schedule 80 PVC pipe surrounded by gravel encased by geotextile filter fabric on all sides, as indicated on Drawing No. 9 of Appendix E. These leachate collection trenches and pipes, which meet applicable requirements of LAC 33:VII.711.B.4.b.vii., will flow on a one percent grade toward sumps located at the perimeter of Cells 1 through 25. This design for a leachate collection system has been proven to be very efficient in the rapid drainage of leachate from a cell, and meets the current design standards for leachate collection systems.

The gravel drain that surrounds the leachate pipe (referenced above) consists of material classified by the Unified Soil Classification System as GW or GP, contains less than five percent fines and is graded such that 95 percent of the material is larger than the perforations of the pipe and less than five percent passes the No. 200 sieve, as specified on Drawing No. 9 in Appendix E. The perforations in the leachate collection pipes are specified on Drawing No. 9, Appendix E, to be 3/8-inch in diameter. Therefore, the gravel has been carefully selected to be larger in size than the pipe perforations. Additionally, limestone, dolomite, or other alternative materials are not included in the design of Cells 1 through 25 at Magnolia Sanitary Landfill.

The placement of geotextile along the sidewalls and base of the leachate trenches is shown on the leachate collection trench detail shown on Drawing No. 9, Appendix E. The one-foot thick protective cover and geotextile filter fabric utilized shall prevent the migration of fines into the leachate collection trench.

Leachate lines or other engineering structures do not penetrate the HDPE bottom liner of the disposal area to be installed as part of the composite liner system in Cells 1 through 25 at Magnolia Sanitary Landfill, with the exception of methane gas vents and upslope riser pipes which will penetrate the 60-mil HDPE liner of the closure cover. At the discretion of the owner/operator, a forty (40) mil flexible membrane liner (FML) may be utilized during installation of the final cover system in lieu of the sixty (60) mil HDPE liner. These penetrations will be sealed as shown in the liner boot detail presented on Drawing No. 12 in Appendix E.

A leachate pump will be installed at the perforated end section of the 18-inch diameter SDR-11 HDPE upslope riser pipes in Cells 1 through 25, as shown on Drawing No. 10 in Appendix E. The leachate collection system for these cells will be maintained with no more than one foot of leachate head above the lowest bottom elevation of the leachate collection lines utilizing pumps controlled by an automatic system. Leachate will be pumped by a submersible pump, located in the sump, through a small diameter line in the upslope riser pipe and connected directly to the forcemain. High level indicators are used to set the running time of sump pumps to maintain one foot of head due to varying conditions of leachate production.

Surface water runoff which collects in the active cell will be pumped by a portable pump through a hose which runs up the slope and also connects directly to the forcemain. This portable pump will rest on the leachate collection sand in the open cell next to the sump. The pump will be controlled by three electronic level sensors which monitor the level of leachate in the sump. One sensor will turn the pump on, another will turn the pump off, and the third sensor will activate a high level alarm. The control systems for pumps, valves, and meters is located on control panels that are operated from the ground surface.

An upslope leachate cleanout riser is provided on both ends of each leachate-collection line. The cleanout pipe is shown on the sump riser pipe section and on the cleanout riser section on Drawing No. 10 in Appendix E. The cleanout pipe is a six-inch diameter Schedule 80 PVC solid pipe that connects with the leachate collection system pipe. This system could be flushed with an appropriate solution, if needed, to provide cleanout of the leachate collection system. Therefore, the length of the leachate-collection lines is the same as the effective length of the cleanout device.

The leachate removed from the landfill cells will be pumped via a HDPE forcemain to the existing oxidation pond shown on Drawing No. 4 in Appendix E. The leachate line has been completed for the entire landfill. It is composed of 4 inch, 6 inch and 8 inch HDPE, and has been pressure tested.

Composite or individual samples of raw leachate will be obtained from the leachate collection system annually and analyzed for the parameters listed in LAC 33:VII.709.E.4.

Leachate from Cell 13 will first be routed to a storage tank on a temporary basis. The tank is a vertical cylindrical vessel and has a nominal volume of 10,000 gallons. The tank has a diameter of 10.5-ft and height of 16-ft. The tank is constructed of carbon steel and rests on 12-inches of recompacted clay overlain by a 60-mil HDPE liner. The HDPE liner is covered with 12-inches of crushed stone. To provide secondary containment, a 3-foot dike surrounds the tank. The HDPE liner covers the dike, ensuring protection in the event of a spill or leak. From the tank, leachate from Cell 13 is transported offsite to a permitted disposal facility via tanker trucks. When the tank is removed from service, the leachate from Cell 13 will be pumped to the force main and treated in the oxidation pond prior to discharge through a permitted outfall.

Drawings No. 2, 3, and 4 show the existing oxidation pond which currently treats leachate prior to permitted discharge. Leachate is treated in the oxidation pond and tested prior to release. A second oxidation pond is also shown on these drawings. This pond was constructed to increase the capacity and performance of the system. The second pond will supplement the 1st oxidation pond and the new pond was lined with 60-mil HDPE liner overlying a three-foot thick recompacted clay liner. This liner system will provide additional protection for the environment. Details of the design of the new leachate treatment pond are provided in Appendix R. The design of the existing oxidation pond is described in Appendix S.

The discharge from the ponds flows to the sedimentation pond located in the northwest corner of the site. The sedimentation pond provides additional treatment (settlement of total suspended solids) prior to discharge, which also offers additional protection of the environment. Additionally, Magnolia is proposing to utilize leachate recirculation as a means to reduce volumes treated for discharge. Recirculation of the leachate would occur either via spraying onto active working faces with little or no cover material, or through recirculation of the leachate into gravel filed trenches constructed within the compacted refuse. This would promote adsorption into and by the waste. Spray recirculation would allow for optimization of the evapotranspiration process, and would be closely monitored to prevent contact with any landfill personnel or truck drivers and their respective trucks and equipment. It is expected that two to three hours per day of recirculation would be used to balance leachate generation volumes, but this rate could vary widely depending on rainfall rates and waste thickness. Landfill personnel would coordinate leachate recirculation activities with respect to other site activities and weather conditions.

The migration of leachate from Cells 1 through 6 of Phase I is prevented by an in-situ clay liner. Cells 7 through 11 have a minimum 3-foot thick recompacted clay liner installed over the entire bottom and sideslopes of the cells. These clay liners were proposed in earlier submittals to the LDEQ and were subsequently approved. These cells also contain leachate collection systems consisting of leachate collection and removal pipes. Cells 7 through 11 also contain a sand drainage layer installed across the floor of the cell. The leachate formed in these cells is removed and routed to the oxidation pond for treatment. Removal of leachate from cells prevents the buildup of leachate "head" in the cell, thereby discouraging the migration of leachate from the cell. The installation of liner system above Cells 1-11 will minimize the production of leachate from the underlying waste material.

Groundwater monitoring has been performed at the site since 1985. To date, no evidence of groundwater impact due to leachate migration has been revealed based on the results of the monitoring program.

Daily, interim, and final cover are applied over the waste in accordance with the requirements of LAC 33:VII.711.B.2., which minimizes the infiltration of water into the waste. Water which has come in contact with refuse will be contained on site for treatment. The system for managing contaminated water, including leachate, utilizes both design provisions and operational techniques to limit production and contain contaminated water within the permitted area. These are as follows:

1. Ongoing final closure. It is a primary site development objective to manage the refuse filling activities such that the finished grades are achieved on an ongoing basis. As soon as practical after the finished grades are achieved, final cover will be applied. The final grades, having 33% side slopes and a minimum 4% top slope, will promote positive drainage off the filled areas, thereby avoiding ponding and erosion. The final cover over the Phase I landfill area is constructed of no less than two feet of clay soils (CH and CL) overlain by a minimum six-inch thick vegetative soil cover. The final cover constructed over the remaining landfill area (Phase II) will be constructed as shown on the Final Cover Detail on Drawing No. 12, which includes installation of a two foot cohesive soil cover overlain by 60-mil HDPE liner and by a minimum 1.5-foot thick vegetative soil cover for areas with slopes of 4%. At the discretion of the owner/operator, a forty (40) mil flexible membrane liner (FML) or LDPE may be utilized during installation of the final cover system in lieu of the sixty (60) mil HDPE liner. A drainage layer will overlay the synthetic liner to enhance drainage of surface water that infiltrates through the vegetative cover. For areas with a 33% slope, the final cover will consist of two feet of clay soils overlain by six inches of top soil with vegetative cover. Placement of the final cover system on an ongoing basis will severely restrict leachate production due to rainwater infiltration.

2. Water management at the working face. The production of contaminated water at the working face (refuse unloading area) will be kept to a minimum by the following:

- Constructing upgradient diversion dikes which will divert uncontaminated water around the working face.

- Constructing a separator berm along the perimeter of the active disposal area of sufficient height to provide containment of contaminated runoff from the working face and segregation from uncontaminated runoff.

- Applying daily cover.

3. Any water that comes in contact with areas that have less than two feet of cover will be routed either directly to the oxidation ponds or contained in the active disposal area. If this water is routed in front of the working face, it will eventually be directly transferred to the oxidation pond(s) or will be introduced to the leachate collection system. This in turn will enable its withdrawal via the manholes located in the Phase I landfill area and via upslope riser pipes to be installed in the Phase II cells. The level of leachate within the fill will be monitored from the manholes and from the upslope riser pipes, and this level will be checked no less than once per month. Leachate withdrawal from the two existing manholes and from the Cell 9 upslope riser pipe will be initiated whenever the level of leachate is found to be greater than two (2) feet above the top of the inlet pipe to the manholes or two feet (vertically) above the top of the upslope riser pipe. Withdrawal will continue until the level of leachate is below the bottom of the inlet pipe to the manhole or equal in depth to the upslope riser pipe diameter. Compliance issues shall deal with whether leachate withdrawal activities were initiated when the level reached the above stated criteria. It will take a certain amount of time to reduce the level of leachate in a manhole below the two foot depth. In addition to the two manholes installed in Phase I which serve Cells 1 through 7, the gas extraction wells to be installed in Phase I may be used to recover both gas and leachate. Cells are equipped with upslope riser pipes at the locations shown on Drawing No. 4 of the report presented in Appendix E. These riser pipes will be installed as shown on Drawing No. 10.

- In Phase I, Cell 1 through Cell 6, the in-situ clay liners of low permeability were left in place by properly controlling the excavation process to achieve the design base grades. These in-situ clay liners on both the bottom and sides of the excavation will control the vertical and horizontal escape of leachate from the refuse fill areas. The remainder of the site will have a minimum 3 foot recompacted clay liner of low permeability on both the bottom and sides which will also control the vertical and horizontal migration of leachate from the refuse fill areas. In the vertical expansion area, Cells 1 through 11 will have 60 mil HPDE installed over the final cap, utilizing the cap as the clay component of the liner system. Cells 12 through 25 will have the 60 mil HPDE installed directly on the three foot recompacted clay liner. This will enhance containment of the leachate, and further minimize leachate production in the initial filled areas of Cells 1 through 11.

4. The landfill design includes a leachate collection system, which will be constructed in stages throughout the life of the site. As currently designed, this system consists of the following components:

- 6" perforated PVC pipe embedded in aggregate;
- 6" PVC riser pipes which connect the collection lines to the surface, thereby allowing access to the lines for cleanout as required;
- two pre-cast manholes located at the low points in the collection system designed primarily for monitoring leachate levels within the fill and leachate withdrawal within the Phase I landfill area, as required.
- an oxidation pond for the storage, treatment, and controlled release of leachate and other contaminated wastewaters once they have been tested and meet the effluent limits of the water discharge permit. This pond was initially designed and sized to treat these waters by surface aeration. The pond is designed such that additional treatment unit processes may be added as needed. See Appendix S and Sheet 11-14 for details. In addition, a second oxidation pond is planned as shown on Drawing No. 2 in Appendix E. The design of this oxidation pond is discussed in the report presented in Appendix R.
- Phase I, Cell 7 utilized a 1 foot thick granular drainage blanket covering the cell bottom. The 6" diameter perforated PVC pipe embedded in aggregate is wrapped with filter fabric to prevent clogging of the leachate lines.
- the leachate collection system in Cells 8 through 11 utilized a one foot thick granular drainage blanket having a coefficient of permeability of 1×10^{-2} cm/sec or greater. The 6" diameter perforated PVC pipe embedded in aggregate is wrapped with filter fabric to prevent clogging of the leachate lines.
- the leachate collection system in Cells 12 through 25 and the continuation of Cells 1 through 11 will utilizes a one-foot thick granular drainage blanket having a coefficient of permeability of 1×10^{-2} cm/sec. or greater. In addition, 6-inch diameter perforated PVC

pipe will be installed in leachate collection trenches placed on a maximum 200-foot spacing. The trenches will contain a gravel drain surrounding the perforated pipe.

6. Contingency Plan. The aforementioned design and operational provisions comprise the leachate management program.

As demonstrated at other Waste Management sanitary landfills, these provisions will sufficiently limit leachate production to quantities which can be absorbed within the refuse fill, or held in an oxidation pond for treatment prior to discharge.

521.F.5. The following information on plans and specifications for groundwater monitoring must be provided for Type I and II facilities:

521.F.5. a. a minimum of three piezometers or monitoring wells in the same zone must be provided in order to determine groundwater flow direction;

The initial groundwater monitoring system included nine monitoring wells (MW-01 through MW-09) which were screened in Stratum III (from approximately 15.25 to 38.50 feet NGVD) and were monitored since 1986. RUST E&I installed fourteen piezometers (PZ-10, PZ-11, PZ-12, PZ-14, PZ-15, PZ-16, PZ-17A-D, and PZ-18A-D) during the 1996 supplemental hydrogeological investigation. Six of these piezometers were screened in Stratum II from approximately 50.17 to 34.15 feet NGVD. The remaining eight piezometers were installed within the sand and gravel portions of Stratum III from approximately 36 to 86 feet bgs (27 to -23 feet NGVD). These wells and piezometers were positioned to allow a determination of groundwater flow direction in both Stratum II and Stratum III. A representative isometric soil profile and cross sections are presented as Figure 7 and Figures 8A through 8E, respectively, of Appendix E, which includes the monitoring wells and piezometers. Details of the piezometer installations, construction, and in-situ permeability testing are presented in the RUST E&I report in Appendix E. A copy of the Piezometer Installation Report has been included as Appendix W.

Based on current and historical groundwater data, the groundwater flow beneath the site is to the south and southeast. The groundwater flow direction is shown on potentiometric maps in Appendix V, while groundwater flow direction as determined during the 1993 and 1996 RUST E&I investigations is presented in Figures 9A through 9F of the RUST E&I report (Appendix E). The potentiometric maps and corresponding groundwater flow directions are considered to be typical and consistent with that generated from the potentiometric maps developed from semi-annual groundwater monitoring events since 1986. As shown on these figures, the groundwater flow beneath the site has been to the south and southeast with an average hydraulic gradient ranging from 0.0005 to 0.001 ft/ft.

521.F.5. b. for groundwater monitoring wells, cross-sections illustrating construction of wells, a scaled map indicating well locations and the relevant point of compliance, and pertinent data on each well, presented in tabular form, including drilled depth, the depth to which the well is cased, screen interval, slot size, elevations of the top and bottom of the screen, casing size, type of grout, ground surface elevation, etc;

The initial investigation of aquifer characteristics and groundwater flow was performed by Southwestern Laboratories, Inc. in 1984. In 1985, STEI installed nine groundwater monitoring wells at the locations and depths approved by the LDEQ. The STEI report on the installation of these wells is presented in Appendix U. RUST E&I performed a geotechnical investigation in 1993 which concluded that the uppermost water-bearing zone in the northeast portion of the facility is encountered from approximately 10 to 15 feet bgs and consists of Stratum II clayey silts. The installation report for the RUST E&I investigation piezometers is included as Appendix W.

Initially there were nine groundwater monitoring wells installed at Magnolia Sanitary Landfill at the locations shown on Figure 1 of Appendix V and Figures 2 and 3 of Appendix E. These original detection monitoring wells, MW-01 through MW-09, were located and constructed in accordance with all regulatory requirements in force at that time. After construction of the original monitoring wells around Magnolia Sanitary Landfill, a report containing information similar to that required by LAC 33:VII.709.E.1.d. was forwarded to and is on file at the LDEQ-Solid Waste Division.

MW-03 through MW-09 were installed at locations greater than the maximum 800-foot distance for downgradient wells required under the current LSWRR. A revised monitor well network was proposed by RUST E&I as a result of the 1996 supplemental hydrogeologic investigation report. This current network consists of a total of 12 monitor wells, and incorporates original wells MW-01 and MW-08, and ten wells installed in 1996 (MW-11 through MW-19).

The uppermost water-bearing zone is defined as Stratum II, where present. Stratum III is identified as the Uppermost Aquifer in those locations where Stratum II is not present. The Uppermost Aquifer which exists beneath the site consists of Stratum III and, where Strata II and III merge (Figure 13 of Appendix E, locations marked in red), Stratum II/III. All monitoring wells included in the current groundwater monitoring network are screened in Stratum III or II/III. Stratum III sands are considered to be alluvium of Quaternary geologic age and groundwater from this unit is typically not used for domestic consumption due to poor water quality.

A soft to very stiff marine clay (Stratum IV) underlies Stratum III in it's entirety beneath the facility. This stratum is consistent with the Cook Mountain formation (Claiborne group) of Tertiary geologic age and represents the lower confining unit.

Evaluation of hydrogeologic data collected during the investigation conducted by RUST E&I in January, February, and June 1996 was used to establish the current monitoring well network for the Magnolia Sanitary Landfill. Evaluation of the hydrogeologic data collected from the site indicates that both the upper-most water-bearing zone (Stratum II) and the Uppermost Aquifer (Stratum III) are required to be monitored. However, these two stratigraphic units merge on the southern (downgradient) portion of the landfill to act as one hydrologic unit (Stratum II/III).

Therefore, the monitor well spacing locations for the downgradient portion of the landfill includes one downgradient well installed within Stratum III (MW-08), six downgradient wells (MW-10, MW-14, MW-15, MW-16, MW-17 and MW-18) to monitor the upper portion of Stratum II, and three downgradient wells (MW-11, MW-12 and MW-13) along the interface of Strata II and III to monitor groundwater quality in both stratigraphic units (acting as one hydrologic unit in these areas). These wells assure that downgradient conditions within Strata II and III are adequately monitored while maintaining the maximum downgradient spacing requirements for a hydrologic unit of 800 feet. The monitor well network, including the location of the relevant point of compliance, is presented on Figure 15 of Appendix E. Pertinent data on each well and piezometer is included in the Piezometer/Monitor Well Construction Summary, provided as Table 3 of Appendix E. Additional details, including screened intervals, pertinent elevations, and well coordinates are provided in the "Summary of Proposed Monitoring Wells", provided as Table 6.

Upgradient monitoring of Stratum II is accomplished utilizing monitor well MW-19. MW-02 (Stratum III) is currently used only for establishing background groundwater quality, and upgradient monitoring of Stratum III is accomplished with monitor well MW-01. Therefore, in accordance with LAC 33:VII.709.E.1.b.ii., the detection monitoring system will utilize a minimum of one upgradient groundwater monitor well per zone (MW-19 for Stratum II and MW-01 for Stratum III). Background data that was collected from monitor wells MW-01, MW-02, and MW-19 was pooled into a single background set for statistical purposes to account for naturally occurring geochemical differences in groundwater quality due to lithologic variations within the strata.

As requested by LDEQ, monitor well MW-09, is monitored for chlorides only until no longer required by the administrative authority. This monitor well is not evaluated on a statistical basis, and is not considered part of the facility groundwater monitoring well network. A concentration versus time chart is prepared for this parameter in accordance with the Groundwater Sampling and Analysis Plan to evaluate whether increasing trends are evident. Monitor well MW-18 replaced MW-09 within the monitor well network to fulfill LAC 33:VII.709.E.1.b.iv spacing requirements.

Monitor well MW-02 has been converted to piezometer status and is used for the collection of background data in Stratum III. It is not considered a part of the facility groundwater monitoring network. It should be noted that this upgradient piezometer, is utilized solely for the purpose of establishing background groundwater quality and exceeds the regulatory requirements of LAC 33:VII.709.E.1.b.ii.

The statistical method used to evaluate the groundwater data for each parameter or constituent at this facility meets the performance standards in accordance with LAC 33:VII.709.E.2.e. The most appropriate method has been selected for each individual parameter based on the analysis of the data. The background groundwater quality information also takes into account multiple sampling events, seasonal variations and special variation of the monitoring wells across the site and within a particular permeable zone. Additionally, the background groundwater quality may require the statistical method to include procedures to control or correct for seasonal and spacial variability, as well as temporal conditions in the data.

The statistical procedures used to evaluate the groundwater monitoring data are dependent on the character of the background data collected. Background constituent concentrations for each parameter listed in the Groundwater Sampling and Analysis Plan (GWSAP) (Appendix F, Table 4-1) have been derived from the analytical results using the statistical methods described in the GWSAP, Section 5, Detection Monitoring Program. The proposed statistical methods were previously submitted to the LDEQ within 90 days after the collection of background groundwater quality data and approved. The statistical evaluation plan established for this facility is technically sound and is the most appropriate method(s) to be protective of human health and the environment. Furthermore, the statistical plan describes the general process for the statistical method based on the number of samples collected.

Currently, two hydraulically upgradient wells, MW-01 and MW-02, are screened within Stratum III. These wells have been monitored since 1985 as the upgradient wells for the original monitoring well network. These wells were used to establish background groundwater quality in accordance with the regulatory requirements of 1986. Existing monitor well MW-02 has been converted to piezometer status for the collection of background data and is not considered a part of the facility groundwater monitoring network. The background groundwater quality has been expanded by additional sampling and analysis to include the additional parameters required in accordance with current regulations.

As previously discussed, all downgradient monitoring wells have been spaced in accordance with LAC 33:VII.709.E.1.b.iv. Each monitor well has been installed in accordance with the Louisiana Department of Transportation and Development guidelines, revised May 1993. As-built drawings and the revised geological and hydrogeological characterization were previously submitted to the Department and are included in Appendix W.

Two observation wells (OW-1 and OW-2) installed during the initial site evaluation and monitoring wells MW-03, MW-04, MW-05, MW-06 and MW-07 have been plugged and abandoned in accordance with the requirements of LAC 33:709.E.1.e.ii. All geotechnical boreholes performed for the site investigations conducted prior to construction of the landfill were abandoned by tremie-grouting the borehole full depth with a cement and bentonite grout mixture. Plugging and abandonment of piezometers, when applicable, has been performed in accordance with the requirements of LAC 33:VII.709.E.1.e.i. prior to future cell excavation. All components of the piezometers at Magnolia Sanitary Landfill have been disposed of in an environmentally sound manner upon plugging and abandonment. The LDEQ-Solid Waste Division will be notified of all plugging and abandonment activities of monitoring wells and geotechnical borings, to include piezometers, at the facility and the appropriate records of these activities will be submitted to the Louisiana DOTD and copies will be maintained in the facility operating record. Information about the current monitoring wells and piezometers installed at the site are discussed in the RUST E&I "Report on Geotechnical Investigation and Landfill Design, Magnolia Sanitary Landfill," presented as Appendix E, and the "Piezometer Installation Report" included as Appendix W.

In accordance with LAC 33:VII.709.E.1.a.ii., the groundwater monitoring system described above is based on, in part, the following factors:

a.) As discussed in response to LAC 33:VII.521.F.5.b, the relevant point of compliance is the vertical surface through the detection monitoring wells, which are located no greater than 300 feet hydraulically downgradient from the landfill limits (see Drawing No. 2 in Appendix E). The relevant point of compliance is on property owned by Magnolia Sanitary Landfill. The hydrological characteristics of the facility and the surrounding land are discussed in the RUST E&I "Report on Geotechnical Investigation and Landfill Design, Magnolia Sanitary Landfill", Appendix E. The monitoring well system was developed based on hydrogeological data collected for the site, including location of permeable zones underlying the site, and the rate and flow direction of groundwater within the pervious zones.

b.) The volume of estimated leachate generation rates were calculated using the HELP computer model (Ref. "The Hydrologic Evaluation of Landfill Performance (HELP) Model," P.R. Schroeder, et. al., U.S. Army Engineer Waterways Equipment Station, 1992. The HELP Model was designed to analyze leachate generation based on the conditions for a one-acre, open cell with five feet of waste, and a sand permeability of 1×10^{-2} cm/sec. The results of the model indicated that the leachate collection system will have an estimated flow of 1,542 gallons per acre per day in an active disposal area prior to placement of final cover.

c.) The facility has been designed to accept all types of solid waste that may legally be received by an industrial solid waste facility designed as a Type I and II in accordance with the regulations. Regulated hazardous wastes are not accepted by the facility for disposal. Hazardous wastes are wastes defined as hazardous in the current Louisiana Hazardous Waste Regulations (LAC 33:V) and/or by the Federal government under the Resource Conservation and Recovery Act and subsequent amendments. Therefore, since the materials accepted for disposal are classified as non-hazardous, the chemical nature of the leachate is similar. Additionally, the chemical nature of the facility will be verified by the representative samples of raw leachate to be collected and analyzed annually in accordance with LAC 33:VII.711.B.4.b.vi.

d.) Information on the proximity and withdrawal rate of groundwater users and the availability of alternative drinking water supplies in the area is contained in Section B of this permit modification.

e.) The monitoring system installed at Magnolia Sanitary Landfill provides maximum protection of human health and the environment through possible early detection of leakage from the units from monitoring the uppermost water-bearing zone (Stratum II) and the Uppermost Aquifer (Stratum III and Stratum II/III) beneath the facility. Additionally, these zones are not reasonably expected to be used as a drinking water supply in the proximity of the landfill.

f.) The ditches at Magnolia Sanitary Landfill convey only non-contaminated surface water runoff and, therefore, a groundwater monitoring system for ditches is considered unwarranted. However, the groundwater monitoring system encompasses the entire facility which includes the perimeter drainage system.

521.F.5. c. a groundwater monitoring program including a sampling and analysis plan that includes consistent sampling and analysis procedures that ensure that monitoring results provide reliable indications of groundwater quality;

Groundwater monitoring for the existing landfill is performed in accordance with the Groundwater Sampling and Analysis Plan developed for Magnolia Sanitary Landfill which is presented in Appendix F. This groundwater sampling and analysis plan includes the procedures for sample collection, preservation and shipment, chain of custody control, and quality assurance/quality control, as required by LAC 33:VII.709.E.2.b.i.-iv. The sampling and analysis plan also includes the list of parameters to be sampled and analyzed for each event, analytical methods to be employed (from SW-846), the sampling frequency during detection monitoring, the statistical method to be used in evaluating the groundwater monitoring data, and the practical quantitation limit (PQL) for each parameter, as specified in LAC 33:VII.709.E.2.c.i.-v. The sampling frequency for Magnolia Sanitary Landfill is semi-annual, which is also stated in the Groundwater Sampling and Analysis Plan.

As requested by LDEQ, monitor well MW-09 has been converted to piezometer status, and is monitored for chlorides only. This piezometer is not evaluated on a statistical basis, and is not considered a part of the facility groundwater monitoring well network. A concentration versus time chart is prepared for this parameter in accordance with the Groundwater Sampling and Analysis Plan to evaluate whether increasing trends are evident.

Magnolia Sanitary Landfill is an existing facility with an established groundwater monitoring system. Background groundwater quality has been established in the hydraulically upgradient wells and downgradient wells for the parameters in accordance with LAC 33:VII.709.E.2.d. The groundwater background quality information was developed to take into account multiple sampling events, seasonal variations and spatial variation of the monitoring wells across the site and within a particular permeable zone. Thus, the number of samples collected to establish groundwater quality data was not only consistent with the appropriate statistical procedures, and addressed additional site-specific variables.

Magnolia Sanitary Landfill will perform statistical analysis on the groundwater analytical data to determine whether or not a statistically significant increase over background level has occurred. The statistical procedures used to evaluate the groundwater monitoring data are dependent on the character of the background data collected. Background constituent concentrations for each parameter listed in the GWSAP (Table 4-1) have been derived from the analytical results using the statistical methods described in the GWSAP Section 5, Detection Monitoring Program. The proposed statistical methods were previously submitted to the LDEQ within ninety days after the collection of background groundwater quality data and approved. The statistical evaluation plan established for this facility is technically sound and is the most appropriate method(s) to be protective of human health and the environment. Furthermore, the statistical plan describes the general process for the statistical method based on the number of samples collected.

The monitoring well and sampling equipment is checked on a periodic basis and during sampling activities to ensure that it is functioning properly. This equipment will be maintained throughout the life of the monitoring program.

521.F.5. d. for an existing facility, all data on samples taken from monitoring wells in place at the time of the permit application. (If this data exists in the Solid Waste Division records, the administrative authority may allow references to the data in the permit application). For an existing facility with no wells, groundwater data shall be submitted within 90 days after the installation of monitoring wells. For a new facility, groundwater data (one sampling event) shall be submitted before waste is accepted;

As stated above, groundwater monitoring has been performed at Magnolia Sanitary Landfill since the nine monitoring wells were installed in 1985. Quarterly groundwater monitoring was performed for the first year, and semi-annual monitoring thereafter. The results obtained from all sampling events have been summarized in the groundwater monitoring reports submitted to the LDEQ-Solid Waste Division, as required by the LSWRR. The data from the latest sampling event is included in the most-recent semi-annual groundwater monitoring report submitted to LDEQ-Solid Waste Division. No evidence of groundwater contamination has been revealed through groundwater monitoring of the existing landfill.

521.F.5. e. a plan for detecting, reporting, and verifying changes in groundwater; and

In accordance with LAC 33:VII.709.E.3.d, LAC 33:VII.711.F.3.d. and LAC 33:VII.713.F.2.b.iv., the detection monitoring program for Magnolia Sanitary Landfill will be conducted for the life of the facility and for the duration of the post-closure care period of 30 years after closure of the facility. Magnolia Sanitary Landfill has submitted groundwater monitoring reports to the LDEQ-Solid Waste Division, since monitoring began in 1985. These reports conformed to the requirements of LAC 33:VII.709.E.3.e. with the exception of LAC 33:VII.709.E.3.e.iii. and v., which are new requirements for solid waste facility groundwater monitoring programs. Conformance with these requirements was initiated when these regulations went into effect.

The groundwater samples collected for each sampling event will be analyzed for the constituents identified in the Groundwater Sampling and Analysis Plan, in Appendix F. The proposed statistical method(s) for detection, reporting and verifying changes in the groundwater were submitted to the Louisiana Department of Environmental Quality (LDEQ) within ninety (90) days after the collection of background groundwater quality data was completed, and were approved. The statistical evaluation plan has been established such that the statistical method(s) chosen are technically sound and are the most appropriate method(s) to be protective of human health and the environment. The proposed statistical method meets the performance standards specified in LAC 33:VII.709.E.2.e.

In accordance with LAC 33:VII.709.E.3.f.iii., if a statistically significant increase over background concentrations is determined for one or more parameters or constituents required to be monitored, Magnolia Sanitary Landfill will within 90 days of determination:

(a). initiate an assessment monitoring program for the facility meeting the requirements of LAC 33:VII.709.E.4. or

(b). submit a report to the Solid Waste Division demonstrating that a source other than the facility being sampled caused the contamination or that the statistically significant increase resulted from an error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

Magnolia Sanitary Landfill will continue the detection monitoring program for the facility until notified otherwise by the LDEQ in writing. If the administrative authority approves the demonstration in LAC 33:VII. 709.E.3.f.iii.(b) in writing, Magnolia Sanitary Landfill will continue the detection monitoring program established for the facility. If the administrative authority does not approve the demonstration in writing, Magnolia Sanitary Landfill will establish an assessment monitoring program meeting the requirements of LAC 33:VII.709. E.4 within 90 days after the determination in LAC 33:VII.709.E.3.f is made.

521.F.5. f. the method for plugging and abandonment of groundwater monitoring systems.

After completion of service, groundwater monitoring wells will be plugged and abandoned in accordance with LAC 33:VII.709.E.1.e and the guidelines provided in "Water Well Rules and Regulations, State of Louisiana" as adopted by the Louisiana Department of Transportation and Development, Water Resources Section, and in the "Construction of Geotechnical Boreholes and Groundwater Monitoring Systems Handbook", prepared by the Louisiana Department of Transportation and Development, Final Version, May 1993.

521.F.6. The facility plans and specifications for Type I and II landfills and surface impoundments (surface impoundments with on-site closure and a potential to produce gases) must provide a gas collection and treatment or removal system.

A passive gas collection system was approved by the administrative authority on January 27, 1994 for the installation of passive flares for the Phase I area of the landfill. Gas collection wells and passive flares were located and constructed in the Phase I area as described in the permit modification to reduce the potential for odors. On June 17, 1996 the administrative authority approved an additional permit modification for the installation of an active gas collection system which eliminated the eight previously approved passive flares and utilization of a single utility flare. The eight existing gas extraction wells were incorporated into the first phase of the active gas collection system which resulted in a total of twenty-seven gas extraction wells. The first phase of the active gas collection system was constructed in accordance with the approved permit modification engineering plans which addressed specific details of, but not limited to, the gas extraction well assembly, typical header casing, and blower and flare station. Drawings No. 14 and 15 of the design report (Appendix E) prepared by RUST E&I have incorporated the active gas collection system details. The installation of the active gas collection system will result in enhancements to operational efficiency for the effective management and control of landfill gas produced through facility operations.

An active gas collection system is planned for Magnolia Sanitary Landfill after the final fill contours have been achieved. A conceptual design for the final active gas collection and treatment system is presented on Drawings No. 13, 14, and 15 of the design report prepared by RUST E&I, which is in Appendix E. It is anticipated the active gas collection system will be installed in phases since the interim or final design (i.e., location and number of gas extraction wells) and ultimately the effectiveness of a gas system is dependent upon the waste mass configuration. The installation of the gas collection system in phases is critical to the safety and operational efficiency of the system and addresses the extraction of gas from the waste mass during site development. Therefore, during the active life of the facility additional gas extraction wells and flares will be installed in phases to control potential odors and gas migration as required. The gas extraction wells and flares installed in the separate phases, similar to those approved by the administrative authority, will be incorporated into or replaced during the installation of the final gas collection system.

The gas collection and treatment or removal system will be flared or connected to a dispersal system, in accordance with accepted practices. This system is designed to limit methane gas to the lower-explosive limit at the facility boundary and to 25 percent of the lower-explosive limit in facility buildings. Currently, gas monitoring is performed around the perimeter of the landfill on a quarterly basis, and the limits described above have not been exceeded. If needed, temporary gas vents could be installed prior to installation of a permanent collection system.

Methane gas monitoring is currently performed on a quarterly basis in accordance with Magnolia Sanitary Landfill's Comprehensive Air Monitoring Plan. A copy of this plan, which includes sampling protocol, chain of custody and test methods, is presented in Appendix G.

In accordance with LAC 33:VII.521.Part II, the applicable sections of LAC 33:VII.713 Standards Governing Surface Impoundments were incorporated into the above responses. However, to maintain clarity and continuity, the following summary is provided to specifically address Magnolia Sanitary Landfill's surface impoundments (Aerated Lagoons or oxidation ponds):

The design drawings, specifications, and operations of the oxidation ponds described in this permit modification are presented in Appendix R, ERI Environmental Services' report, "Aerated Lagoon Design, Magnolia Sanitary Landfill". The design drawings, specifications, and operations of the oxidation ponds have been prepared by, or under the direct supervision of Mr. Frank P. Frey, a Professional Engineer licensed and registered in the State of Louisiana.

The oxidation ponds are protected by two perimeter levees (facility and individual pond) to a minimum of 68.8 feet NGVD, which provides a two-foot freeboard above the 100-year flood elevation of 66.8 feet NGVD, as determined by the U.S. Army Corps of Engineers. The oxidation pond design details are shown in the ERI Environmental Services' report presented in Appendix R. The oxidation ponds perimeter levees have been engineered to minimize wind and water erosion through utilization of grass cover and protective HDPE cover, respectively, to preserve structural integrity.

The design of the facility oxidation ponds includes the installation of a 60-mil HDPE liner over a three-foot thick recompacted clay liner to the pond elevations shown in Appendix R. Construction of the oxidation pond liners used quality control procedures which generally include inspection and testing sufficient to determine that the clay material and geosynthetic membranes used for liner construction meets the specifications. A summary of the CQA procedures for soil and geosynthetic installation is presented in Appendix H. The liner installation and CQA plans for soils and geosynthetics require the CQA work to be supervised by a Professional Engineer, registered in the State of Louisiana, with the appropriate expertise.

Quality control procedures generally include inspection of excavations, monitoring of clay placement, compaction, testing of compacted lifts for density, moisture content, and permeability, documentation of all tests performed, inspection and testing of reworked areas, and verifying liner thickness. These records will be included as part of the "as-built" documentation for each completed section of the oxidation ponds. Based on the laboratory data of samples obtained from the clay liner, the compacted permeability of the clay must be no greater than 1×10^{-7} cm/sec.

The site information utilized in the stability, settlement and heave analyses of the facility design presented in Appendix E adequately demonstrates that, for the oxidation ponds, the liner was or will be placed upon a base that provides adequate support for the contents; provides sufficient resistance to settlement such that the liner integrity will not be affected; and provides sufficient resistance to hydrostatic heave.

Desiccation of the clay liner was prevented during construction through controlled application of water to the surface of the clay, if needed. After construction, the clay liner was prevented by the presence of the overlying HDPE liner. The HDPE liner prevented the escape of moisture from the upper surface of the clay liner.

The previous and recent geotechnical investigations at the facility did not reveal any circumstances or geologic site conditions which would warrant special design conditions, the inclusion of secondary liners, or the inclusion of a leak detection system in the design of the facility and oxidation pond(s). The designs of Cells 1 through 11 and the existing oxidation pond currently in operation at Magnolia Sanitary Landfill were previously approved by LDEQ without the inclusion of these special design considerations.

A gas collection and treatment or removal system for the oxidation ponds is not warranted for this design since the potential for methane gas production is insignificant. The oxidation ponds currently in operation at Magnolia Sanitary Landfill were previously approved by LDEQ without the inclusion of a methane gas collection and treatment or removal system. Methane gas monitoring is currently performed around the perimeter of the landfill, which includes the area of oxidation ponds, on a quarterly basis in accordance with Magnolia Sanitary Landfill's

Comprehensive Air Monitoring Plan. To date, the monitoring results indicate the methane gas concentrations of LAC 33:VII.713.B.4.c. have not been exceeded. A copy of the plan presented in Appendix G describes in detail the sampling protocol, chain-of-custody and test methods of the methane gas monitoring program.

521.G. Facility Administrative Procedures. Standards governing facility administrative procedures are contained in LAC 33:VII.711.C (Type I and II landfills).

(Note: All applicable sections of LAC 33:VII.Chapter 7 were addressed and incorporated into the responses presented below in accordance with LAC 33:VII.521.Part II.)

521.G.1. The following information on administrative procedures is required for all facilities:

521.G.1. a. recording system; types of records to be kept; and the use of records by management to control operations;

Records are maintained during the life of the facility and are kept on file for at least three years after closure pursuant to LAC 33:VII.711.C.1.b. The following records are maintained at Magnolia Sanitary Landfill and these records are available to LDEQ officials during facility inspections:

(1) Copy of the current Louisiana Solid Waste Rules and Regulations;

(2) the permit;

(3) the permit application;

(4) permit modifications;

(5) certified field notes for construction;

(6) operator training programs;

(7) daily log;

(8) quality assurance/quality control records;

(9) inspections by the permit holder or operator including but not limited to inspections to detect incoming hazardous waste loads;

(10) Board of Certification and Training for Solid Waste Disposal System Operator Certificates (if applicable);

(11) records demonstrating that liners, leachate-control systems, and cover systems are constructed or installed in accordance with appropriate assurance procedures;

(12) records on the leachate volume and results of the leachate sampling;

(13) monitoring, testing, or analytical data;

(14) any other applicable or required data deemed necessary by the administrative authority;

(15) records on groundwater sampling results;

(16) post closure monitoring reports; and

(17) copies of all documents received from and submitted to the Department .

The above records are used by Magnolia Sanitary Landfill in monitoring the operational effectiveness of facility personnel in conducting disposal activities. Additionally, the information from the record system is utilized in preparation of submittals to the administrative authority such as Annual Disposer reports, construction certification documents and environmental monitoring reports.

Magnolia Sanitary Landfill maintains records of all waste transporters transporting waste that process or dispose of waste at the facility. The records include information to the extent required by LAC 33: VII.711.C.1.b.ii. The records include, at a minimum, the date of receipt of waste and the transporter's solid waste identification number issued by the administrative authority.

Magnolia Sanitary Landfill submits annual solid waste reports to the Office of Management and Finance, Financial Services Division each year in accordance with LAC 33:VII.711.C.1. The reports cover the period from July 1 of each year through June 30 of the following year (beginning July 1, 1992) and are submitted to the administrative authority by August 1 of each reporting year. The reports include the requested waste quantity calculations for both in-state and out-of-state generators and an estimate of remaining capacity of the landfill. The seven digit industrial waste number assigned by the administrative authority is identified in the annual reports.

521.G.1. b. an estimate of the minimum personnel, listed by general job classification, required to operate the facility; and

The daily operations of the Magnolia Sanitary Landfill are performed under the direction of a Site Manager. His job responsibilities cover the general operation, employment, planning, scheduling, reporting, environmental compliance, and collection of applicable user fees. It is his responsibility to ensure that the operating procedures at the site are performed in accordance with those incorporated into this permit document. As a minimum, the daily landfill operations are performed by two (2) equipment operators, one (1) laborer, and one (1) ticket taker or gate supervisor. A mechanic is on call to perform scheduled or unscheduled maintenance at the maintenance facility. All employees are instructed and trained in accordance with the Training Plan, presented in Appendix M.

Magnolia Sanitary Landfill employs the necessary certified operators, security personnel, maintenance personnel, and management personnel to achieve the operational requirements of the facility. All personnel involved in waste handling at the facility are trained in the procedures to recognize and prevent the disposal of regulated hazardous wastes and regulated PCBs at the facility. These procedures are summarized in the document "Special Waste Quality Assurance System", which is presented in Appendix L. Operations personnel are also trained in safety procedures as outlined in the Contingency and Emergency Procedures Plan, which is presented in Appendix N.

521.G.1. c. maximum days of operation per week and per facility operating day (maximum hours of operation within a 24-hour period).

Hours of operation are typically from 5:00 a.m. to 8:00 p.m. on a six (6) day per week schedule excluding holidays and are posted on a sign near the gate outside of the facility. The operating hours may be extended up to 24 hours as needed to accommodate special events of emergency situations and in this event, hours reflecting this potential contingency mode of operation will be posted on a sign near the gate outside of the facility. Prior to extending hours, a verbal notification to the permits division will be made and a written notification will be submitted. In the event the facility would need to remain open 24 hours, sufficient equipment shall be provided for safe operations during the nighttime hours. Other activities pertaining to the landfill including construction, equipment maintenance, office procedures, etc. may be conducted beyond these hours.

521.G.2. Administrative procedures for Type II facilities shall include the number of facility operators certified by the Louisiana Solid Waste Operator Certification and Training Program (R.S. 37:3151 et seq.).

The required number of facility operators certified by the Louisiana Solid Waste Operator Certification and Training Program will be maintained at Magnolia Sanitary Landfill. In accordance with LAC, Title 46, Part XXXIII, the facility will have at least one level "A" operator assigned. At least one level "A" or level "B" operator will be present at the facility during hours of operation. Additionally, the facility shall have at least one level "C" operator for each 10 operational people (clerical staff not included) during hours of operation.

Operator certificates are prominently displayed at the landfill facility. Each key employee is trained in the proper rules and procedures of operation of solid waste facilities. The Board of Certification and Training for Solid Waste Disposal System Operators and the LDEQ Solid Waste Division will be notified within 30 days of any changes of employment for the certified operators.

521.H Facility Operational Plans. Standards governing facility operational plans are contained in LAC 33:VII.711.D. (Type I and II landfills).

(Note: All applicable sections of LAC 33:VII.Chapter 7 were addressed and incorporated into the responses presented below in accordance with LAC 33:VII.521.Part II.)

521.H.1. The following information on operational plans is required for all facilities:

521.H.1. a. types of waste (including chemical, physical, and biological characteristics of industrial wastes generated on-site), maximum quantities of wastes per year, and sources of waste to be processed or disposed of at the facility;

Magnolia Sanitary Landfill has been designed to accept all types of solid waste that may legally be received by an industrial solid waste facility designed as a Type I and II in accordance with the provisions of LAC 33:VII.Subpart I. Regulated hazardous waste is not received. Hazardous wastes are wastes defined as a hazardous waste in the current Louisiana Hazardous Waste Regulations (LAC 33:V) and/or by the Federal government under the Resource Conservation and Recovery Act and subsequent amendments.

The types of waste accepted for disposal are:

1. Garbage, trash, construction materials, etc. - which are typical waste generated from municipalities and commercial business.

2. Non-hazardous industrial process solid wastes. The sources and quantities of this waste will vary during the life of operation of the facility; however, currently approximately 20 percent of the waste received is non-hazardous industrial waste.

3. Only infectious waste from hospitals or clinics which has been properly packaged and identified, and is certified by Department of Health and Human Resources will be accepted by the Magnolia Sanitary Landfill.

4. Solidified liquid wastes, with administrative approval of this modification, if sufficient generator demand exists. Previous approvals by the administrative authority allows various facilities within the state to accept liquid wastes which must be solidified prior to disposal. Therefore, with administrative authority approval of this modification, Magnolia Sanitary Landfill requests the operational capability to provide an environmentally safe method of solidification and disposal of non-hazardous liquid waste. The solidification

process will only be included in facility operations if sufficient generator demand exists. The quality assurance/quality control program describing the solidification procedures, if adopted, is presented as Appendix K. Liquid wastes are not disposed of in the landfill unless the waste is a household waste or solidified as approved above. Additionally, containers holding liquid waste will not be allowed for disposal at Magnolia Sanitary Landfill unless the requirements of LAC 33:711.D.1.g.ii. are met.

The volume of waste currently received is approximately 34,000 tons per month. The waste received is a combination of industrial, residential, and commercial refuse. However, the sources and quantities of this waste will vary during the life of the operation. The current quantity of waste accepted per year is approximately 400,000 tons per year, but the maximum quantity of waste which can be accepted per year is estimated to be 650,000 tons per year.

Non-hazardous industrial waste is received at this site. Non-hazardous liquid and semi-solid sludges acceptable for solidification are also received. Solidification is accomplished by mixing with fly ash, lime, kiln dust or other suitable solidification materials.

The receipt of regulated hazardous waste and regulated PCB waste shall be strictly prohibited. To detect and prevent entry of these wastes, the "Quality Assurance and Quality Control Program for Waste Acceptance," presented in Appendix L, sets forth methods as precautions and controls to record and monitor incoming wastes. The program includes random inspections of incoming loads to detect and prevent disposal of waste excluded by the facility permit.

521.H.1. b. waste-handling procedures from entry to final disposition, which could include shipment of recovered materials to a user;

Vehicles entering the facility will be weighed or measured by the gatehouse attendant prior to entering the disposal area. The receiving clerk logs in the truck and directs it to the unloading area. For industrial waste, the receiving ticket is completed noting the location where the waste is deposited. Commercial collection vehicles are not allowed to proceed into the landfill until authorized by the receiving clerk. Upon completion of acceptance procedures described in the Quality Assurance and Quality Control Program for Waste Acceptance, the vehicle will be directed to either the active disposal area or community drop off area (green-box). Haulers not familiar with the facility will be provided instruction and their loads closely checked for the specific acceptance requirements. Proper placement of signs will instruct drivers as to speed limitations, site precautions, movement of traffic and direction to the working face of the active landfill cell to facilitate uniform traffic flow. During unloading, the waste is visually monitored by the operator. If any hazardous waste is detected, the vehicle is not allowed to leave the site until the disposition of such waste is resolved.

Small non-commercial vehicles are allowed to dispose of waste in containers near the entrance gate to avoid traveling into the tipping area. This area is identified as the "community drop off" or "green box" area. These containers, when filled, are hauled to the tipping area for disposal.

Industrial process solid wastes that require improvements in their physical characteristics for ease in handling are mixed with a solidification agent or other non-hazardous wastes (e.g. fly ash, kiln dust or similar products). The handling, mixing and details of disposal schemes are evaluated by means of physical testing. Additional information can be found in Appendix K, Quality Assurance and Quality Control Program for Solidification.

Solid wastes difficult to compact may require mixing with sand, silt, clay or other material. The proper mix is determined by physical testing in the laboratory and/or by field demonstration.

Trash delivered to the site in loose form and containing items such as appliances or bulky containers may be segregated and such items mechanically compacted to reduce their buried volume. Open burning of refuse will not be practiced at Magnolia Sanitary Landfill as a waste handling method in accordance with LAC 33:VII.711.D.1.b. Additionally, solid waste shall not be deposited in standing water and all waste will be deposited in the smallest practical area, spread and compacted in layers approximately two feet thick, or, if baled, the waste will be stacked and covered daily. Both salvaging and scavenging are prohibited at Magnolia Sanitary Landfill.

The waste acceptance and testing procedures for receiving domestic sewage sludge, asbestos, industrial solid waste, incinerator ash or non-hazardous petroleum contaminated media and debris generated by underground storage tanks corrective action for Magnolia Sanitary Landfill are presented in the "Quality Assurance and Quality Control Program for Waste Acceptance," Appendix L. The QA/QC Program was developed in accordance with the Louisiana Administrative Code 33:VII. Solid Waste Regulations including Sections 521, 709, and 711. The program specifically provides preacceptance procedures to determine the acceptability of a waste pursuant to facility permit conditions, operational capabilities and state and federal regulations.

Waste from hospitals and clinics that is properly packaged and identified, and certified non-infectious is accepted for disposal at Magnolia Sanitary Landfill.

Filling within a unit (cell) proceeds in approximately 20-feet high by 200-feet wide sections. Filling generally begins on the high end and proceeds toward the opposite end of the cell, which is lower in elevation. The general development of each cell is to reach approximate final grades within a cell prior to filling within the next cell. This may be highly dependent on site conditions at the time these elevations are reached as well as weather conditions. The unloading area is maintained large enough to facilitate side-by-side unloading, when practical, without undue delay due to equipment operations. As the permitted height is attained, interim cover and interim compacted cover is placed over those sections of the disposal area.

The Landfill Development Plan, presented in Appendix E as Drawing No. 6, indicates the general construction and fill sequence of the landfill cells. If landfill development varies significantly from that shown, LDEQ Solid Waste Division will be informed through modification of the permit. No grazing of livestock is allowed at Magnolia Sanitary Landfill.

521.H.1. c. minimum equipment to be furnished at the facility;

At a minimum, the following equipment or equipment providing equivalent performance is furnished at the landfill:

1 - Compactor
1 - Dozer
1 - Backhoe
1 - Dump Truck

Additional equipment will be added as operational needs dictate.

521.H.1. d. plan to segregate wastes, if applicable;

Wastes will not be segregated except for white goods and similar 'clean' metals at the working face through use of the on-site heavy equipment. No hand picking will be allowed at the working face. Private individual householder disposals are placed in a roll-off container(s) specifically sited for user safety and convenience. Occasional waste streams (large tree limbs, brush, shingles, bulky items, etc.) disposed of by private individuals may be managed at the active working face. Roll-off containers from the 'green-box' area will be dumped at the working face, when full, before the landfill personnel leave the site each day. If the container is not full it will be tarped at closing and dumped the following working day. The tarp is designed to minimize odors, fires, vectors, litter, infiltration of rainwater, and generally meet the objectives of a cover applied daily. In the event odor or vector problems should occur, site management will take immediate action to eliminate the problem. Control measures for odor may include emptying and cleaning out containers. Vectors will be handled in a manner consistent with safe practices and with the consultation of LDEQ representatives.

White goods, scrap iron, and other metals will be collected in a 20-40 cubic yard container placed near the residential (green-box) disposal area or near the working face, in order to maximize the recoverability of these items. In the event that white goods filter to the active working face, an operator will push/pull that item to an inactive area by means of a machine (dozer, compactor, etc.). At the end of the day, those items separated by heavy equipment will be loaded into the specified container. As this container is filled, it will be transported to the designated outlet (yet identified). White goods shall be removed every 30 days from the facility. Additionally, the facility shall maintain a log of dates and volumes of white goods removed from the facility.

A separate permitted unit for disposal of tree limbs, leaves, clippings, and similar residues does not exist at Magnolia Sanitary Landfill. These wastes are therefore disposed of with other refuse in the active landfill area.

A separate permitted unit does not exist at the facility for construction material and woodwastes, therefore, the requirements of LAC 33:VII.711.D.5.c. concerning the deposition of these wastes do not apply.

521.H.1. e. procedures planned in case of breakdowns, inclement weather, and other abnormal conditions (include detailed plans for wet-weather access and operations);

Procedures for extraordinary circumstances and abnormal conditions include these provisions. (1) Inclement weather poses no unusual problem because this operation has clay cover stockpiles, hard surfaced and all weather roads to and from working areas, egress routes above the 100 year flood elevation along with surface water runoff sumps and diversion ditches. (2) Equipment downtime is limited due to on-site maintenance facilities that routinely provide preventive care and regular repairs. Should the breakdown be such that a work stoppage is caused, an immediate replacement by rental contract or purchase would be made. (3) The site supervisor's judgement based on training and experience plus corporate policy permit on location authority to take decisive and corrective action relative to any and all extraordinary matters effecting individual and public health or safety.

Temporary roads that provide access to the landfill are graded to drain surface water off to the side. These roads are surfaced with crushed rock or similar material to maintain integrity during wet weather. Appreciable amounts of water are not able to pond on these roads, therefore, operational methods or changes during wet weather is not needed to maintain the roads.

The exterior levee slopes and drainage system around the landfill are verified annually for evidence of erosion and other potential problems. Any areas that have experienced significant erosion are repaired and ditch areas that are not draining properly are remedied. The on-site drainage system and the run-on diversion system will be maintained to serve their intended function.

521.H.1. f. procedures, equipment, and contingency plans for protecting employees and the general public from accidents, fires, explosions, etc., and provisions for emergency care should an accident occur (including proximity to a hospital, fire and emergency services, and training programs); and

The facility Contingency and Emergency Response Procedures, presented in Appendix N, includes detailed procedures for emergency situations such as accidents, fires, explosions, etc. These emergency procedures include communications, organization, and response activities in case of accident, fire, explosion or other emergencies. The telephone numbers for the local hospital, fire department, and emergency services are listed in the Procedures. The Contingency and Emergency Response Procedures will be filed with the local fire department and closest hospital and clinic. The plan will be updated when implementation demonstrates that a revision is needed.

The Training Plan presented in Appendix M was developed to provide employees with the knowledge necessary to insure safe and efficient operation of the facility. As indicated in the Training Plan, emergency and safety training is conducted annually for evacuation procedures, first aid training, preparation for hurricanes and floods, and for the City of Monroe fire department.

521.H.1. g. provisions for controlling vectors, dust, litter, and odors.

Food or harborage is denied to rats, insects and birds to the extent possible by placement of daily and interim cover and adequate compaction of the waste. If an infestation of vectors is observed, an approved pesticide shall be applied in accordance with applicable state and federal laws. If inspections reveal infestation of vectors and additional measures (beyond placement of daily and interim cover) are required for vector control such as pesticide application or other remedial measures, a schedule for the type and frequency of application or remedial measures will be submitted to the administrative authority for approval. Additionally, grazing of domestic livestock is not allowed on open or operating areas of Magnolia Sanitary Landfill.
Dust from access roads is controlled through application of water to the road surface as required.

The daily, interim, and final cover at Magnolia Sanitary Landfill is maintained to enhance aesthetic appearance. The extensive compaction of the waste and cover soils mentioned above and/or the placement of the daily cover minimizes the occurrence of blowing paper and litter. In addition, the area of the working face is limited to minimize problems with litter. Portable litter fences are used, as necessary, to confine litter during periods of high wind. Landfill operational personnel are required to collect and dispose of litter blown from the active disposal area in a timely manner. On-site litter will be picked up during normal or routine housekeeping activities to maintain an aesthetic appearance. Should conditions (e.g., high winds) produce excessive amounts of litter which cannot be picked up in one day, the cleanup will continue on succeeding days until completed.

Odors are controlled through good compaction of the waste and installation of daily and interim cover material. Odors will also be controlled through installation of gas collection flare(s) and/or a gas collection and treatment system, in accordance with LAC 33:VII.711.B.6.a. A passive gas collection system was approved by the administrative authority on January 27, 1994 for the installation of passive flares for the Phase I area of the landfill. Gas collection wells and passive flares were located and constructed in the Phase I area as described in the permit modification to reduce the potential for odors. On June 17, 1996 the administrative authority approved an additional permit modification for the installation of an active gas collection system which eliminated the eight previously approved passive flares and utilization of a single utility flare. The eight existing gas extraction wells were incorporated into the first phase of the active gas collection system which resulted in a total of twenty-seven gas extraction wells. A conceptual design for the final active gas collection and treatment system is presented on Drawings No. 13, 14, and 15 of the design report prepared by RUST E&I, which is in Appendix E. It is anticipated the active gas collection system will be installed in phases since the interim or final design (i.e., location and number of gas extraction wells) and ultimately the effectiveness of a gas system is dependent upon the waste mass configuration. The installation of the gas collection system in phases is critical to the safety and operational efficiency of the system and addresses the extraction of gas from the waste mass during site development. Therefore, during the active life of the facility additional gas extraction wells and flares will be installed in phases to control potential odors and gas migration as required. The gas extraction wells and flares installed in the separate phases, similar to those approved by the administrative authority, will be incorporated into or replaced during the installation of the final gas collection system. The sampling protocol, chain-of-custody, and test methods used in the gas monitoring system at Magnolia Sanitary Landfill are described in the Methane Gas Monitoring Plan, presented in Appendix G.

521.H.2. The following information on operational plans is required for Type I and Type II facilities

521.H.2. a. a comprehensive operational plan describing the total operation, including (but not limited to) inspection of incoming waste to ensure that only permitted wastes are accepted; traffic control; support facilities; equipment operation; personnel involvement; and day-to-day activities.

A quality assurance/quality control [QA/QC] plan shall be provided for facilities receiving industrial waste; domestic-sewage sludge; incinerator ash; friable asbestos; nonhazardous petroleum-contaminated media; and debris generated from underground storage tanks [UST], corrective action, or other special wastes as determined by the administrative authority. The QA/QC plan shall include (but shall not be limited to) the necessary methodologies; analytical personnel; preacceptance and delivery restrictions; and appropriate responsibilities of the generator, transporter, processor, and disposer. The QA/QC plan shall ensure that only permitted, nonhazardous wastes are accepted;

A comprehensive operational plan which describes waste acceptance at the landfill, the waste inspection and testing procedures, personnel monitoring activities, and equipment operation, is presented in the document "Quality Assurance and Quality Control Program for Waste Acceptance," included as Appendix L.

The QA/QC program sets forth procedures to monitor incoming loads and verify that incoming wastes correspond with pre-acceptance waste characterization and the provisions of the facility permit. The program additionally establishes methods as precautions and controls to determine, record, and monitor incoming wastes to detect and prevent entry or disposal of regulated hazardous waste.

In accordance with LAC 33:VII.711.D.2.g. and h., the operational plan for Magnolia Sanitary Landfill includes the following engineering protocols and testing frequencies to ensure that the leachate collection and treatment system is functioning as designed to remove and transport leachate for treatment.

The leachate collection and treatment system is inspected monthly to ensure the system is functioning properly. The automatic pumping system is equipped with sensors and alarms which alert facility personnel of a malfunction. Repairs will be undertaken as quickly as possible to return the system to its design requirement. If facility inspections and recordkeeping indicates the leachate collection and treatment system is requiring a higher level of maintenance than can be reasonably explained, the system will be investigated with appropriate actions taken.

The depth of the leachate is monitored on a continual basis by the use of automatic sensors which trigger a high level alarm indicating the level of leachate is above the regulatory level of one foot. The sumps which collect leachate are equipped with a pump and sensor switch. When the level of leachate reaches a depth of one foot above the inlet pipe, the pump will automatically activate and begin removing leachate. High level indicators are used to set the running time of sump pumps to maintain one foot of head due to varying conditions of leachate production.

The leachate is removed through lines that run up from the cell through the manholes (Phase 1) or upslope riser pipe and connect into the forcemain. The forcemain discharges directly into the oxidation pond(s) shown on Drawing No. 4, Appendix E. A surface aerator in the pond promotes aerobic biological degradation of the organic compounds in the leachate. Leachate would be recirculated either through spray recirculation or through introduction into gravel filled trenches buried within the compacted refuse. Spray recirculation would take place at an active working face where there is little or no cover material, promoting adsorption into the waste as well as optimization of the evapotranspiration process. The spraying would be closely monitored to prevent contact with any landfill personnel or truck drivers and their respective trucks and equipment. It is estimated that two to three hours per day of recirculation would be sufficient to balance leachate production, but this rate would vary widely with rainfall and waste thickness. The Leachate Recirculation Plan is included in Appendix L.

In accordance with LPDES Permit No.LA0075817, presented in Appendix Q, truck wash waters generated in the facility washdown/maintenance area will be routed to the oxidation pond(s) for treatment prior for discharge offsite. As approved by the administrative authority, the washdown area at the facility will be utilized to washdown all on-site vehicles and vehicles used to transport waste for the local Waste Management of Louisiana, Inc. hauling company. The truck wash waters will include the washdown waters from routine maintenance of the landfill equipment.

Treated leachate from the oxidation pond(s) may be utilized to rinse trucks that deliver liquid waste for solidification. This treated leachate will be solidified with the liquid waste and disposed in landfill cells. The rinsate will not be stored in the landfill but hard piped to the solidification basin from the oxidation pond where it will be contained within the solidification basin and solidified. Therefore, no discharge will occur.

In accordance with LAC 33:VII.713.D.2 and LAC 33:VII713.D3.b, c and d, both the oxidation and sedimentation ponds are designed (Appendices R and S) and will be constructed, maintained and operated to prevent overtopping due to any circumstances. As a safeguard against this occurrence, both impoundments will be inspected daily and after storms to detect any deterioration or malfunction of the levee system and impoundment capacity problems. In the event a leak is discovered the administrative authority shall be notified in accordance with LAC 33:I.Subpart 2.

In accordance with LAC 33:VII.713.D.2.g, the oxidation pond will be visually inspected periodically to determine if excessive sludge buildup exists. If excessive buildup is detected, the sludge will be removed by pumping to the solidification basin where it will be solidified and then disposed of within the landfill

521.H.2. b. salvaging procedures and control, if applicable; and

Except for the controlled salvaging of white goods and metal as described in the response to LAC 33:VII.521.H.1.d for the purpose of being recycled, there will be no other salvaging permitted. The time interval between off-loading and cover is too brief to allow any type of discrete waste separation. Employees and users will be specifically and expressly prohibited from salvaging in the normal course of action through direct supervision and by well placed warning signs.

521.H.2. c. scavenging control.

There will be no scavenging permitted. Controls against this are the same established for salvaging. Additional precautions include entry to site denial, fencing and lockable gates. The presence of the perimeter fence prevents unauthorized access to the landfill, except by willful entry. Additionally, trespassing by unauthorized personnel is not allowed.

521.H.3. The following information on operational plans is required for type I and II landfarms.

This section is not applicable. Magnolia Sanitary Landfill is a Type I/II Landfill.

521.H.4. The following information on operational plans is required for Type I-A and I-A incinerator waste handling facilities and refuse-derived energy facilities.

This section is not applicable. Magnolia Sanitary Landfill is a Type I/II Landfill.

521.H.5. The following information on operational plans is required for Type I-A and II-A refuse derived fuel facilities and Type III separation and composting facilities.

This section is not applicable. Magnolia Sanitary Landfill is a Type I/II Landfill.

521.H.6. The operational plans for Type I-A and II-A refuse derived fuel facilities and Type III separation and composting facilities must include a description of marketing procedures and control.

This section is not applicable. Magnolia Sanitary Landfill is a Type I/II Landfill.

521.H.7. The operational plans for Type I and II facilities receiving waste with the potential to produce gases must include a comprehensive air monitoring plan.

A Comprehensive Air Monitoring Plan has been developed for Magnolia Sanitary Landfill and is presented in Appendix G. The plan includes a program to monitor for the presence of landfill gas along the site property lines and to monitor the potential for gas accumulation within on-site structures that will limit methane gas to less than the lower-explosive limits at the facility boundary and to 25 percent of the lower-explosive limits in facility buildings. If monitoring indicates the possibility of off-site migration, additional monitoring will be performed to determine the extent of migration beyond the property line and the potential for accumulation within off-site structures.

The Comprehensive Air Monitoring Plan was developed based on the soil conditions, hydrogeologic conditions, and hydraulic conditions surrounding the facility and the location of the facility structures and property boundaries. Monitoring for combustible gas concentrations will be performed on a quarterly basis at the barhole probe locations shown in the Comprehensive Air Monitoring Plan presented in Appendix G. If the methane gas levels are equal or greater than the lower-explosive limit at the facility boundary or 25 percent of the lower-explosive limit in facility buildings, additional requirements of the Comprehensive Air Monitoring Plan (Appendix G) will become effective. Steps will be taken to ensure the protection of human health and the administrative authority will be notified of the levels of the gas concentrations. Within seven days of detection, a report will be submitted to the administrative authority that provides the methane gas levels detected and a description of the steps taken to protect human health. A remediation plan will be submitted within 30 days to the administrative authority describing the nature and extent of the problems and the proposed remedy with an implementation schedule as specified in LAC 33;VII.521.D.3.a.iii.(b). The plan will be implemented within 60 days of detection.

Magnolia Sanitary Landfill will notify the administrative authority if strong odors occur at the facility boundaries. Records of inspections, surveys, and all gas monitoring results are on file at Magnolia Sanitary Landfill. A gas collection system has been installed at Magnolia Sanitary Landfill which collects and flares methane gas. With this system in place, the gas produced at the landfill should be controlled in accordance with the site's Part 70 Operating Permit Number 2160-00075-V0 found in Appendix Q.

In accordance with LAC 33:VII.521.Part II, the applicable sections of LAC 3:VII.713 Standards Governing Surface Impoundments were incorporated into the above responses. However, to maintain clarity and continuity, the following summary is provided to specifically address the surface impoundments (Aerated Lagoons or oxidation ponds) at Magnolia Sanitary Landfill:

As previously stated in the response to LAC 33:VII.521.H.1.a. and b., the receipt of regulated hazardous waste shall be strictly prohibited and prevented. The comprehensive Quality Assurance and Quality Control Program for Waste Acceptance (QA/QC) program, presented in Appendix L, is in place at Magnolia Sanitary Landfill for the acceptance of industrial solid waste, nonhazardous petroleum-contaminated media, debris generated by underground storage tank (UST) corrective actions and incinerator ash. The program sets forth methods as precautions and controls to detect and prevent entry of hazardous wastes and any other excluded wastes that present special handling or disposal problems and to determine, record and monitor incoming wastes. The program also includes random inspections of incoming loads to detect and prevent disposal of waste excluded by the facility permit. Additionally, open burning; salvaging, with the exception of controlled salvaging of white goods, metals and other materials for recycling purposes; and scavenging will not be allowed at Magnolia Sanitary Landfill. The QA/QC program will require advance notification and the required analytical test data from generators prior to acceptance of industrial wastes or special wastes such as sewage sludge, which is classified by Magnolia Sanitary Landfill as a special waste. Incinerator ash will not be received by Magnolia Sanitary Landfill without following the preacceptance procedures presented in Appendix L, which will require testing of the material for TCLP metals and dioxins as specified by LAC 33:VII.711.D.3.d.iii.

The design of Magnolia Sanitary Landfill includes an oxidation pond for the storage, treatment, and controlled release of leachate and other contaminated wastewaters once they have been tested and meet the effluent limits of the water discharge permit. In addition, a second oxidation pond is planned as shown on Drawing No. 2 in Appendix E. The design of this oxidation pond is discussed in the ERI report "Aerated Lagoon Design, Magnolia Sanitary Landfill" presented in Appendix R. Untreated leachate and stormwater run-off from the active disposal area will be routed to the oxidation pond (aeration lagoon) and then to the existing oxidation pond for treatment. Biological degradation will occur in the lagoon, then exiting the northwest corner. Flow will be recorded, then regulated with a manual butterfly valve. A high level overflow line will be tied in downstream of the control valve. At this point, pipe flow will be continuously sloped downhill to prevent "vapor locking." It is anticipated that the discharge from the facility oxidation pond treatment system will be monitored in accordance with a Louisiana Water Discharge Permit. The testing frequencies and effluent limitations established in the discharge permit will be utilized to evaluate the design efficiency of the treatment system.

Perimeter levees were constructed around the existing oxidation pond to a minimum of 68.8 feet NGVD, which provides a two-foot freeboard above the 100-year flood elevation of 66.8 feet NGVD, as determined by the U.S. Army Corps of Engineers. The two-foot freeboard provides adequate protection against overtopping by overfilling, wave action, or action of storms. The oxidation ponds will be inspected daily and after storms to detect any evidence of deterioration of the dikes, overtopping, malfunctions, or improper operation. Excessive vegetative growth that prevents proper access, inspection, or operation, or may provide a conduit for groundwater contamination shall be removed. Magnolia Sanitary Landfill will notify the administrative authority if a leak in the oxidation ponds is found.

The exterior levee slopes and drainage system around the landfill and oxidation pond(s) are verified annually for evidence of erosion and other potential problems. Following the annual inspection, any areas that have experienced significant erosion or segments of the perimeter ditch that may not be draining properly will be repaired.

The on-site drainage system and the run-on diversion system will be maintained to serve their intended function. Additionally, roads that provide access to the oxidation ponds are graded to drain surface water off to the side. These roads will be maintained to insure integrity during wet weather. Water will not be able to pond on these roads to affect utilization during wet weather, therefore, operational methods or changes during wet weather are not needed to maintain the roads.

As responded to in LAC 33:VII.521.H.7, the Comprehensive Air Monitoring Plan developed for Magnolia Sanitary Landfill (Appendix G) was based on the soil conditions, hydrogeologic conditions, and hydraulic conditions surrounding the facility and the location of the facility structures and property boundaries. The plan includes a program to monitor for the presence of landfill gas along the site property lines and to monitor the potential for gas accumulation within on-site structures that will limit methane gas to less than the lower-explosive limits at the facility boundary and to 25 percent of the lower-explosive limits in facility buildings. If monitoring indicates the possibility of off-site migration, additional monitoring will be performed to determine the extent of migration beyond the property line and the potential for accumulation within off-site structures. Records of inspections, surveys, and all gas monitoring results will be on file at Magnolia Sanitary Landfill.

Odors will be controlled to the extent possible through the proper operation of the oxidation pond treatment system. The efficiency of the system will be monitored by testing discharges for water discharge permit effluent parameters. Magnolia Sanitary Landfill will notify the administrative authority if strong odors occur at the oxidation ponds. The oxidation ponds treatment system is expected to be in compliance with Title 5 of the Clean Air Act.

As responded to in LAC 33:VII.521.H.1.f., Magnolia Sanitary Landfill's Contingency and Emergency Response Procedures, presented in Appendix N, includes detailed procedures for emergency situations such as accidents, fires, explosions, etc. Magnolia Sanitary Landfill's employee training and safety procedures are addressed in the Training Plan, which is presented in Appendix M. This program was developed to provide employees with the knowledge necessary to insure safe and efficient operation of the facility.

521.I. Implementation Plan. Standards governing implementation plans are contained in LAC 33:VII.709.D (Type I and II facilities).

(Note: All applicable sections of LAC 33:VII.Chapter 7 were addressed and incorporated into the responses presented below in accordance with LAC 33:VII.521.Part II.)

521.I. 1. The implementation plans for all facilities must include the following:

521.I.1. a. a construction schedule for existing facilities which shall include beginning and ending time-frames and time-frames for the installation of all major features such as monitoring wells and liners. (Time-frames must be specified in days, with day one being the date of standard permit issuance); and

521.I.1. b. details on phased implementation if any proposed facility is to be constructed in phases.

521.I.2. The implementation plans for Type I and II facilities must include a plan for closing and upgrading existing operating areas if the application is for expansion of a facility or construction of a replacement facility.

Magnolia Sanitary landfill is an existing facility which began landfill operations in 1985 under Standard Permit No. P-0046 issued by the LDEQ, Solid Waste Division. Since 1985, the site has installed all major features necessary to conduct facility operations in accordance with the LSWRR. The facility disposal area as approved in previous permit applications and presented in this renewal application will be developed dependent upon the rate or volume of waste accepted. The construction of all disposal areas will be in accordance with LAC 33:VII.509.D, and will vary with weather and operational conditions.

521.J. Facility Closure. Standards governing facility closure are contained in LAC 33:VII.711.E. (Type I and II Landfills).

(Note: All applicable sections of LAC 33:VII.Chapter 7 were addressed and incorporated into the responses presented below in accordance with LAC 33:VII.521.Part II.)

521.J.1. The closure plan for all facilities must include the following:

521.J.1. a. the date of final closure;

The estimated date of final closure for the entire site is March 2040. This calculation is based upon the initial disposal rate of 34,000 tons per month and a remaining design life of 37 years for the site. Within 90 days prior to closure of a landfill cell, Magnolia Sanitary Landfill will notify the administrative authority, in writing, of intent to close the unit. The notification will include the date of planned closure, any proposed modifications to the approved closure plan, and the schedule and estimated cost of closure, as requested. Mandatory inspections and certifications will also be solicited during the closure interval.

521.J.1. b. the method to be used and steps necessary for closing the facility; and

A major site development objective is to manage the refuse-filling activities such that the finished grades are achieved on a progressive basis, then final-covered and vegetated as soon as practical. In this way, closure takes place throughout the life of the site and no area which has been brought up to final grade will remain without the required final cover for more than a few months. The largest area of the landfill unit requiring final cover for the currently permitted or modified landfill footprint is approximately 20 acres. Final cover installation shall be initiated for this 20-acre area no later than 30 days and completed no later than 90 days following final receipt of solid waste in the 20-acre area of the unit unless an extension is granted by the administrative authority due to inclement weather.

Within a few months after final cover is applied, the area will be seeded. Areas which are covered, closed, and are growing vegetation will be maintained in an aesthetically-pleasing manner. Periodically, areas which have received final cover and have been vegetated will be inspected for erosion, vegetative stress, etc. These areas will be repaired as necessary. The planning, installation and maintenance procedures for the final cover system will ensure the following:

- The cover system designed meets the requirements of 40 CFR, Part 258 and the LSWRR and satisfies the requirements of minimizing infiltration of precipitation, fire hazards, odors, vector food and harborage, as well as discouraging scavenging and limiting erosion.

- Standing water will not be allowed to remain in a cell prior to closure. If water is present, it will be solidified or removed.

- Final machine compacting and grading of the daily cover will be performed before installation of the final cover begins.

- Daily or interim cover will be installed over the waste and will be graded prior to application of the final cover system, as discussed in the Closure and Post-Closure Plan, presented in Appendix T.

- The runoff-diversion system will be maintained until the final cover is installed over the landfill.

- The runoff-diversion system will be modified, if necessary, to prevent overflow of the landfill to adjoining areas.

- An insect and rodent inspection will be performed prior to installation of the final cover. If a problem with insects or rodents is observed during the inspection, extermination measures will be provided to eliminate the problem.

- A grass cover will be established over the entire landfill following final closure to provide erosion protection. If needed, other areas of the facility, such as former borrow areas, will also be graded and restored to a natural appearance.

- A gas collection and treatment system will be installed after the final fill contours have been achieved.

521.J.1. c. the estimated cost of closure of the facility, based on the cost of hiring a third party to close the facility at the point in the facility's operating life when the extent and manner of its operation would make closure the most expensive.

A cost estimate for closure of the Phase II portion of the landfill (Phase I is closed) for the stated conditions is presented in the Closure and Post-Closure Plan, presented in Appendix T.

521.J.2. The closure plan for Type I and II landfills and surface impoundments must include:

521.J.2. a. a description of the final cover and the methods and procedures used to install the cover;

521.J.2. b. an estimate of the largest area of the facility ever requiring a final cover at any time during the active life;

521.J.2. c. an estimate of the maximum inventory of solid waste ever on-site over the active life of the facility; and

521.J.2. d. schedule for completing all activities necessary for closure.

Of the two final cover options stated in LAC 33:VII.711.E.3.a.ii., the option which would provide the lower-permeability cover is a cover that is "at least as impermeable as the liner system beneath the cover".

Future disposal areas (Cells 12 through 26) will utilize a bottom liner system which contains a geomembrane liner as the least permeable component and, therefore, the cover system has been designed to also include a geomembrane (60-mil textured HDPE) liner. In addition, a 2-foot thick cohesive soil cover with a permeability of $1x10^{-7}$ cm/sec or less will be installed on top of the intermediate or daily cover to provide support for the geomembrane liner and to also minimize surface water infiltration.

The existing disposal areas (Cell 1 through Cell 11) used an in-situ clay liner or three-foot of recompacted clay liner with a permeability of 1×10^{-7} cm/sec or less. Therefore, these areas will receive a final cover system of a minimum of 24 inches of recompacted clay with a permeability of less than $1x10^{-7}$ cm/sec to minimize surface water infiltration.

The final cover systems described above will be as impermeable as the liner system on the floor of the landfill for each respective area.

The Closure and Post-Closure Plan presented in Appendix T discusses in detail the items listed in LAC 33:VII.521.J.2.a.-d above. The final closure cover contours are shown on Figure 3 and a typical final cover section is shown on Figure 4 of the referenced closure plan.

The closure cover presented in plan view on Figure 3 and in cross section on Figure 4 of the Closure and Post-Closure Plan (in Appendix T) is designed to minimize the generation of leachate, thereby minimizing the potential release of leachate to groundwater or surface waters. The cohesive soil cover will be installed in accordance with the quality control procedures described in the Soil Cover Installation and Testing Plan, which is presented in Appendix A of the Closure and Post-Closure Plan. The synthetic liner will be installed in accordance with the procedures stated in the Summary of Quality Control and Quality Assurance Procedures for the Installation of Geosynthetic Lining Systems, which is presented in Appendix B of the Closure and Post-Closure Plan.

The administrative authority will be notified when facility closure has been completed in accordance with the approved Closure and Post-Closure Plan.

521.J.3. The closure plan for all Type I and II facilities and Type III woodwaste and construction/demolition debris facilities shall include the following:

521.J.3. a. the sequence of final closure of each unit of the facility, as applicable;

The landfill site will consist of a continuous fill area operated as an area fill above and below natural ground. The fill area will be brought up to design grades and final cover will be applied on an ongoing basis. The Phase I portion of the landfill has achieved final grade and, therefore, received final cover. Successive closure of additional areas will be performed throughout the life of the site.

521.J.3. b. a drawing showing final contours of the facility; and

The final contours of the facility are shown on Figure 3 of the Closure and Post-Closure Plan presented in Appendix T. The contour elevations were designed for effective drainage utilizing final cover side slopes no steeper than 3(H):1(V) and final cap top slopes of approximately seven and ten percent.

521.J.3. c. a copy of the document that will be filed upon closure of the facility with the official parish recordkeeper indicating the location and use of the property for solid waste disposal, unless the closure plan specifies a clean closure.

A copy of the document which will be filed in the parish mortgage and conveyance records following final closure of the facility is presented in Appendix C of the Closure and Post-Closure Plan (in Appendix T). The document provides information concerning the specific location of the facility, use of property for solid waste disposal, and the name and address of the person with the knowledge of the contents of the facility. A true copy of this document, certified by the Parish Clerk of Court, will be provided to the Solid Waste Division.

In accordance with LAC 33:VII.521.Part II, the applicable sections of LAC 33:VII.713 Standards Governing Surface Impoundments were incorporated into the above responses. However, to maintain clarity and continuity, the following summary is provided to specifically address Magnolia Sanitary Landfill's surface impoundments (Aerated Lagoons or oxidation ponds):

Magnolia Sanitary Landfill anticipates the oxidation ponds will remain open for the life of the landfill and at a minimum through the post-closure period of up to 30 years for the landfill. However, in accordance with LAC 33:VII.713.E., a Clean-Closure Plan was developed for the oxidation pond(s) and is presented in Appendix T. The Closure Plan addresses notification, preclosure, closure, cost estimates and post-closure care requirements for the oxidation pond(s) in accordance with LAC 33:VII.713.E.1 through 5. Magnolia Sanitary Landfill shall notify the administrative authority in writing at least ninety days before closure or intent to close, seal or abandon the oxidation pond(s). The notification shall provide the date of closure, any proposed modifications to the approved Clean-Closure Plan (Appendix T) and the schedule and estimated closure costs in accordance with LAC 33:VII.713.E. The administrative authority will be notified when closure has been completed in accordance with the approved plan so this determination can be made.

The oxidation ponds currently in operation at Magnolia Sanitary Landfill were previously approved by LDEQ without the inclusion of a methane gas collection and treatment or removal system. Therefore, a gas collection and treatment or removal system is not warranted for the oxidation pond since the potential for methane gas production or migration is insignificant.

The oxidation ponds are constructed with perimeter levees which prevent surface water run-off from the units to the adjoining areas during a 24-hour/25-year storm event. Additionally, the oxidation pond design includes adequate freeboard to prevent over-topping by wave action. The runoff-diversion system will be maintained and modified, if necessary, to prevent overflow of the oxidation pond to adjoining areas.

521.K. Facility Post Closure. Standards governing post-closure requirements are contained in LAC 33:VII.711.F. (Type I and II landfills).

(Note: All applicable sections of LAC 33:VII.Chapter 7 were addressed and incorporated into the responses presented below in accordance with LAC 33:VII.521.Part II.)

The groundwater monitoring data obtained since monitoring began in 1987 is on file with the administrative authority. Based on this data, there has been no evidence to date of any release from the landfill. The cover system planned for the landfill should be very effective in minimizing the generation of leachate and, therefore, the chance of a release occurring should diminish with time. Based on these considerations, and that Magnolia Sanitary Landfill will continue to receive waste after October 9, 1993, a 30-year post-closure monitoring period in accordance with LAC 33:VII.711.F.2.a. will be implemented.

521.K.1. The post-closure plan for all facilities must include the following:

521.K.1. a. specification of the long-term use of the facility after closure, as anticipated; and

The long-term use of the facility will be evaluated at the time of closure. The use of the site after closure is anticipated to be recreational. Possible recreational uses include:

1. Golf Course
2. Baseball/Softball Field
3. Football/Soccer Field
4. Horseback Riding
5. Campground
6. Other Outdoor Recreational Activities

521.K.1. b. the cost of conducting post-closure of the facility, based on the estimated cost of hiring a third party to conduct post-closure activities in accordance with the closure plan.

An estimate of the cost of hiring a third party to conduct post closure activities for the facilities is presented on Table 4 in the Closure and Post-Closure Plan, presented in Appendix T.

521.K.2. The post-closure plan for Type I and II facilities must include the following:

521.K.2. a. the method for conducting post-closure activities, including a description of the monitoring and maintenance activities and the frequency at which they will be performed;

The Closure and Post-Closure Plan, presented in Appendix T, includes a description of the post-closure activities to be conducted for the landfill.

The final cover placed on the landfill will be maintained for 30 years after closure. Maintenance activities will include mowing the grass cover, as needed, and monthly inspections of the cover for evidence of burrowing, erosion, settlement, subsidence, or other events, as specified in LAC 33:VII.711.F.3.a. If any problems with the cover are noted, they will be repaired as necessary to maintain the integrity of the cover.

The post-closure care activities that will be performed for maintaining the integrity and effectiveness of the final cover will include monthly inspections of the cover and making necessary repairs to correct the effects of settlement, erosion, burrowing, or subsidence. Annual reports will be submitted to the LDEQ, Solid Waste Division, documenting the maintenance of the final cover over the landfill. Additional details concerning post-closure care are presented in the Closure and Post-Closure Plan, presented as Appendix T.

The leachate collection and removal system will be maintained and operated until leachate is no longer generated or until the amount of leachate generated is negligible. The LDEQ Solid Waste Division will be notified prior to the removal of the leachate collection and removal system.

A gas collection and treatment or removal system and gas-monitoring system will be maintained and operated throughout the post-closure monitoring period.

The groundwater monitoring system will be maintained and monitored for a period of thirty years, as required by LAC 33:VII.713.F.2.a.i.

521.K.2. b. the method for abandonment of monitoring systems, leachate collection systems, gas-collection systems, etc;

At the completion of the post-closure period, applicable portions of the leachate and the methane gas collection wells and the groundwater monitoring wells will be abandoned in accordance with the procedures stated in "Construction of Geotechnical Boreholes and Groundwater Monitoring Systems Handbook," prepared by the LDEQ and the Louisiana Department of Transportation and Development (April 1993) or current regulations. Applicable portions of the leachate and methane gas collection systems will be abandoned as deemed appropriate by backfilling the holes with small bentonite chips (and hydrating) or with a bentonite-grout mixture. Groundwater monitoring wells for the landfill will be plugged and abandoned in accordance with the guidelines presented in "Water Well Rules and Regulations, State of Louisiana" (LAC 70:XIII).

521.K.2. c. measures planned to ensure public safety, including access control and gas control; and

Access to the site after closure and during the post-closure period will be controlled through maintenance of existing perimeter fencing and all access gates will be locked to discourage unauthorized site entry except by willful intent. All required postings and markings will be provided.

For cells with an in-situ clay liner or a minimum of three feet of recompacted clay (with 1 X 10-7 cm/sec or less permeability) as the bottom liner system, the closure cover will consist of a minimum of 2 feet of recompacted clay meeting the same permeability, overlain by a minimum of six inches of soil capable of sustaining vegetative growth.

The final cover of each closed landfill area will be fertilized and planted with native grass seed or other shallow rooted vegetation to promote good growth and easy care, and to minimize soil erosion. Closure will be considered complete after the final cover has been inspected and approved, and the vegetative cover has been placed. Final closure of the site will be achieved when all cells 9currently permitted and future expansions) have been filled and closed.

Following placement of final cover over the entire landfill, WML will update the Ouachita Parish mortgage and conveyance records by entering the specific location of the facility and specifying that the property was used for the disposal of solid waste. The document will identify the name and address of a person with knowledge of the contents of the facility. A copy of the form to be used for this purpose is presented in Appendix C of the Closure and Post Closure Plan. A certified copy of the document will be obtained from the clerk of court and filed with the LDEQ Solid Waste Division.

The integrity of the final cover will be maintained, including making repairs as necessary to correct the effects of settlement, subsidence, and erosion, and preventing run-off and run-on from damaging the cover. During the post-closure period, leachate collection systems will be maintained and the leachate collected will be properly managed and disposed until leachate is no longer generated or until ceasing this activity is approved by the administrative authority.

The gas collection and treatment or removal system will be maintained and operated throughout the post-closure period for control of gas. The groundwater monitoring system will be maintained during the post-closure period, and monitoring will be performed as required by the administrative authority.

The above measures and those described in detail in the Closure and Post Closure Plan (Appendix T) are planned for the facility in the post-closure period to ensure public safety.

521.K.2. d. a description of the planned uses of the facility during the post-closure period.

The long-term use of the facility after closure and during the post-closure period is anticipated to be recreational. Possible recreational uses include:

1. Golf Course
2. Baseball/Softball Field
3. Football/Soccer Field
4. Horseback Riding
5. Campground
6. Other Outdoor Recreational Activities

In accordance with LAC 33:VII.521.Part II, the applicable sections of LAC 33:VII.713 Standards Governing Surface Impoundments were incorporated into the above responses. However, to maintain clarity and continuity, the following summary is provided to specifically address the surface impoundments (Aerated Lagoons or oxidation ponds) at Magnolia:

Magnolia Sanitary Landfill anticipates the oxidation ponds will remain open for the life of the landfill and at a minimum through the post-closure period of up to 30 years for the landfill. However, in accordance with LAC 33:VII.713.E., a Clean-Closure Plan was developed for the oxidation pond(s) and is presented in Appendix T. The Closure Plan addresses notification, preclosure, closure, cost estimates and post-closure care requirements for the oxidation pond(s) in accordance with LAC 33:VII.713.E.1 through 5. Magnolia Sanitary Landfill shall notify the administrative authority in writing at least ninety days before closure or intent to close, seal or abandon the oxidation pond(s). The notification shall provide the date of closure, any proposed modifications to the approved Clean-Closure Plan (Appendix T) and the schedule and estimated closure costs in accordance with LAC 33:VII.713.E. The administrative authority will be notified when closure has been completed in accordance with the approved plan so this determination can be made.

521.L. Financial Responsibility. Standards governing financial responsibility are contained in LAC 33:VII.727. A section documenting financial responsibility according to LAC 33:VII.727 which contains the following information, must be included for all facilities:

521.L.1. **the name and address of the person who currently owns the land and the name and address of the person who will own the land if the standard permit is granted (if different from the permit holder, provide a copy of the lease or document which evidences the permit holder's authority to occupy the property); or**

521.L.2. **the name of the agency or other public body that is requesting the standard permit; or, if the agency is a public corporation, its published annual report; or, if otherwise, the names of the principal owners, stockholders, general partners, or officers;**

Magnolia Sanitary Landfill is owned by Waste Management of Louisiana, Inc., a Louisiana Corporation and is a wholly-owned subsidiary of Waste Management, Inc. - Southwest Group which is a wholly-owned subsidiary of WMX Technologies, Inc.

The 2004 or most recent published annual report for Waste Management, Inc. is presented as Appendix P.

521.L.3. **evidence of liability coverage, including:**

521.L.3. **a.** **personal injury, employees, and the public (coverage, carriers, and any exclusions or limitations);**

521.L.3. **b.** **property damage (coverage and carrier);**

521.L.3. **c.** **environmental risks; and**

Waste Management of Louisiana, Inc., as permit holder and owner of Magnolia Sanitary Landfill shall maintain liability insurance or its equivalent for sudden accidental occurrences in accordance with LAC 33:VII.727.A.1.a.. A Certificate of Insurance is included in Appendix O for $1 million per occurrence and $2 million annual aggregate for the site.

521.L.4. **evidence of a financial assurance mechanism for closure and/or post-closure care.**

Waste Management of Louisiana, Inc., as permit holder and owner of Magnolia Sanitary Landfill shall establish and maintain financial assurance for closure and post-closure care in accordance with LAC 33:VII.727.A.2.a.-i. A copy of the Surety Bond established to cover Closure and Post Closure is provided in Appendix O along with the Standby Trust fund documentation.

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521. M. Special Requirements

The administrative authority may require additional information for special processes or systems and for supplementary environmental analysis.

Magnolia Sanitary Landfill will provide additional information for special processes or systems and for supplementary environmental analysis as requested by the administrative authority.

Environmental Assessment Statement

The proposed activity consists of vertically expanding the existing landfill operation. There is a lesser impact on the environment when an existing secure facility is maintained at its present location than when a new facility is developed where there is no existing facility. Recognizing the differences in the environmental impact of existing and new facilities, Magnolia Recycling and Disposal Facility (RDF) provides the following discussion:

(1) The potential and real adverse environmental effects of the proposed permit activities.

Because the proposed activity is a vertical expansion only of the existing permitted activity; there are no different or increased potential and real adverse environmental effects. For the proposed vertical expansion, no additional land area is utilized. The proposed permit activities therefore do not have the potential to impact additional land.

While solid waste facilities, in general, have potential short-term effects for air emissions and contaminated run-off, and long-term effects are limited to the potential for groundwater infiltration, these effects are not increased through the vertical expansion of an existing facility. To the contrary, vertically expanding an existing facility (which has operated for over 15 years) in lieu of siting a new facility on virgin land minimizes potential impacted areas. Additionally, since this permit modification includes vertically expanding a pre-Subtitle D area, the additional liners placed over the area will minimize the potential for leachate generation thereby reducing potential environmental impact in this area.

As in the case of the existing facility, the following steps have been taken in the proposed vertical expansion to avoid any potential or real adverse effects on the environment due to the presence of the facility.

1. A fence is present around the site to deter unauthorized entrance to the site.

2. The perimeter levee present around the existing landfill will prevent storm water entry into the active area or a release of untreated water from the active area.

4. The deposited waste will continue to be covered daily to prevent odors, harborage of rodents, insect disease vectors or other similar events from becoming a problem.

5. The active area of the landfill as vertically expanded will be minimized by applying interim and final covers over the landfill as soon as areas reach final elevations. The interim and final covers will be graded and vegetated to minimize erosion.

6. Waste Management of Louisiana, LLC (WML) has demonstrated expertise, competence and experience in the operation of modern sanitary landfills thereby eliminating any potential effect that may result from inexperienced or untrained operators.

7. The floor and sideslope areas of landfill cells are lined with a minimum three-foot

thick layer of low permeability recompacted clay (1×10^{-7} cm/sec or less), overlain by a 60-mil high density polyethylene (HDPE) liner. This composite liner will prevent the migration of leachate from the landfill.

8. A leachate collection system is installed to remove leachate from the landfill and maintain the leachate head at a maximum of one foot over the floor of the landfill cells.

9. The installed groundwater monitoring system will continue to be monitored semi-annually to detect any release from the landfill at the earliest possible time.

10. Complete records of all material and vehicles entering the landfill are maintained for security purposes.

11. No scavenging or burning of waste, no illegal dumping, and no hazardous wastes or prohibited wastes are allowed at the landfill.

12. The landfill and its proposed vertical expansion have been designed to ensure structural stability of the mass and long-term performance of the composite liner and leachate collection system, as demonstrated by engineering design calculations.

13. Only nonhazardous wastes are accepted by the facility. Waste inspection procedures will be in place to ensure that hazardous waste is not accepted.

14. Gas collection wells are installed to minimize potential odors and control air emissions.

15. With the exception of Magnolia RDF own well, there are no water supply wells operating within the site, nor within 2000 feet of the site perimeter. The nearest public water system or domestic well is about 4500 feet north of the site

Possible pathways for potential environmental impacts for the vertical expansion, as in the case of the existing landfill operation, may include air, water, soil, and food. Via the air pathway, landfill gas may be discharged with a small non-methane fraction ($<0.05\%$). The use of daily covers and the implementation of a gas control system will minimize the potential impact of this pathway. If hazardous wastes are inadvertently received and contaminated stormwater is not contained, contaminants could enter surface waters containing living organisms and used for fishing and recreation. However, the site levees and drainage system have been sized to contain all run-off from a 25 year/24 hour storm. Furthermore, in the unlikely event of a release, site personnel are equipped and trained to quickly contain any release that may occur outside of a containment area (i.e. an overturned truck) to prevent any impacts to water or soil. If any water is impacted, it will be collected and treated according to LPDES requirements. Soils will be excavated and disposed of in accordance with all applicable requirements.

If a failure did occur in the landfill's lining system and the generated leachate was not properly collected, the potential exists for the contaminated water to penetrate subsurface confining layers and enter the underlying groundwater zones. However, the shallow groundwater zones beneath the site are monitored by the facility's groundwater monitoring network to detect a release as early as possible. In the event of a release, immediate action would be taken to ensure groundwater quality is monitored and an appropriate response taken. In addition, shallow groundwater beneath the site is not used for potable consumption.

The designed protection systems and planned rapid response to any potential incidents for the expanded facility will ensure that all pathways that potentially may endanger local residents or other living organisms, including air, water, soils, and food, are minimized to the maximum extent.

All material that is landfilled contains no free liquids as determined by the paint filter liquids test. The majority of the wastes received at the facility will be directly landfilled immediately. However, any wastes containing free liquids will be stabilized using commercially available non-hazardous drying agents prior to landfilling.

Prior to the placement of waste within a cell or holding area, berms are constructed for run-on/run-off control. If a significant storm event is within 24 hours of reaching the facility, all wastes are covered to prevent contamination of any stormwater that could exit the containment areas.

The facility accepts solid wastes that are non-hazardous under LAC 33.V. 105. The wastes are not listed as hazardous and do not have characteristics of hazardous wastes. The facility will not accept hazardous waste and has a comprehensive Quality Control/Quality Assurance Program to ensure they are not received at the facility.

The degradation of wastes within the landfill generates leachate. The leachate and any stormwater that comes in contact with waste materials are collected and segregated from non-contact waters. The landfill has a composite lining system consisting of a 60-mil HDPE flexible membrane and 2 feet of low permeability recompacted clay (1×10^{-7} cm/s). In addition, an extensive leachate collection system prevents the accumulation of generated leachate. The drainage system is comprised of a 1-foot layer underlain by gravel drains and 6-inch schedule 80 PVC perforated collection pipe. The composite lining and collection system substantially reduce the likelihood of a release to underlying groundwater zones. Vertically expanding the current site reduces potential environmental impacts by minimizing areas that contain waste materials. Furthermore the vertical expansion of a pre-Subtitle D area reduces potential infiltration and leachate accumulation in areas without synthetic liners.

On site generation of solid waste is expected to be less than one percent of the total waste handled. It will be limited to accumulated trash from offices and residual wastes from cleaning and maintenance operations. Used oil and other maintenance fluids will be collected and recycled or disposed off site by properly licensed handlers. Accordingly, the site's operations do not create environmental impacts.

Off site generation of waste is from municipal and industrial sources. The primary source will be residential customers. Commercial and industrial generators will also be disposing waste at the facility. The typical percentages of waste are as follows:

On Site:	$<1\%$
Residential/Commercial:	85%
Industrial:	15%

The residential, commercial, industrial and on site solid wastes are placed in lined landfill cells. After each cell reaches its design elevation, it will be capped in accordance with the facilities closure plan.

The following on site security systems have been installed for the existing facility and are therefore included as part of the vertical expansion: a six foot high chain link fence along the entire boundary, manning of the main gate by security personnel during operation, manning or locking of the remaining entries to the facility, security lighting of the gates and perimeter, an alarm system with alarm activation panels, telephone and radio systems for communication with on site and off site emergency personnel and employees, protection of all tanks, pipelines, valves, and other handling equipment from transportation activities, posting of warning signs at the main gate and along the fence line.

Qualified operating personnel assigned to operate the facility participate in training plans, quality assurance/quality control programs and safety programs. Each new employee is trained in the general orientation and operation of the facility. Furthermore, a training program related to the specific duties of each job function is specifically tailored to that position. No employee is permitted to work unsupervised until the employee has successfully completed all elements of the training program. This introductory training will be completed within six months of the new employee's entry into a specific assignment. In addition, every employee will participate in training updates to maintain proficiency, learn new techniques and procedures, and reinforce safety and compliance consciousness. Furthermore, the training program is designed to familiarize personnel with: emergency procedures, emergency equipment, and emergency systems including the use of communication and alarm systems; procedures for using, inspecting, repairing and replacing facility emergency and monitoring equipment; response to groundwater contamination incidents, shut-down of operations, and response to fires, explosion and other emergency events.

In the proposed vertical expansion, the potential and real adverse environmental effects have been avoided to the maximum extent possible.

(2) **A cost-benefit analysis of the environmental impact costs of the proposed activity balanced against the social and economic benefits of the activity which demonstrates that the latter outweighs the former.**

Prior to the construction of the Magnolia RDF, Ouachita Parish had numerous unpermitted, unlined disposal sites. The major site that was used by the parish was found inadequate by the DNR in March, 1981 and placed under a compliance order to close. A total often (10) deficiencies were noted, some having significant potential environmental problems. Without the availability of the Magnolia RDF, hauling costs to the nearest available site will significantly increase along with tipping fees. The increased cost for solid waste collection and disposal would be expected to have an adverse effect on the amount of indiscriminant dumping taking place within the parish. Because of these and other negative arguments against not having a "state-of- the-art" disposal facility, the Ouachita Police Jury commissioned a Solid Waste Management plan for the Parish that would utilize the sanitary landfill as a priority disposal facility.

The Police Jury specified that the study should involve a Parish-wide plan, as well as a system that is, "efficient and economical." The study stated that, "the parish will be much better off once a plan for eliminating solid waste mismanagement is implemented. Environmental protection measures of the proposed sanitary landfill essentially preclude environmental impact costs. Furthermore, the proposed landfill will provide significant social and economic benefits in the form of safe disposal of solid waste in a relatively remote location at a reasonable disposal fee." In conclusion, the very low environmental impact costs, when balanced against the social/economic benefits of the facility, demonstrate that the facility is warranted.

The current landfill was constructed in 1985 by Waste Management of Louisiana to replace numerous small "dumps" that were scattered throughout the region. These "dumps" were unlined, were constructed without environmental controls, were improperly covered, and were not protected from surface water run-on/run-off. It was determined that a facility was required that could provide a regional solid waste benefit. The vertical expansion of the Magnolia RDF will ensure that the availability of the facility will be extended and maximize the use of the existing footprint.

Currently there is no integrated solid waste management plan for Louisiana or for the area in and around Ouachita Parish. In accordance with the Louisiana Resource Recovery and Development Authority Letter of Conformity Magnolia RDF does not conflict with any plans or proposed resource recovery facilities. Magnolia RDF provides an economical solid waste disposal resource to Ouachita and the surrounding parishes; therefore, Magnolia RDF would almost certainly be included in any regional solid waste management plan.

This facility has been planned with the lull knowledge and approval of the local governing authority, the Ouachita Parish Police Jury, which receives royalty payments from the facility. This expansion is proposed to ensure that a solid waste facility for the proper and environmentally sound disposal of solid wastes will be available on a long-term basis for Ouachita Parish and surrounding area.

The waste receipts of the existing operation demonstrate the solid waste needs for the area. Between the years 1990 through 2000, the annual waste receipts have ranged from just under 200,000 tons per year to almost 450,000 tons per year. This data supports the need for the existing facility. It will be most economical to the residents of the region and extend the availability of a much need facility, if the available volume can be efficiently utilized as proposed in this modification.

The landfill brings much-needed taxes to the parish. Additionally, Magnolia RDF also provides royalty fees to the Parish government. Magnolia RDF has paid more than $200,000 in royalty fees to the Parish during the past three years. Without Magnolia RDF, the Parish would require additional taxes to replace the revenue generated by the landfill.

Magnolia RDF, Waste Management, and companies dependent on the landfill, provide jobs for more than 200 people in Ouachita Parish. About 13 of those jobs are at the landfill. Approximately 100 employees provide equipment and labor to companies that use the landfill's services. There are 68 additional jobs at Waste Management in Ouachita Parish. These jobs involve waste collection and transportation in Ouachita Parish and are dependent on the existence of the landfill. The company and subcontractors' annual payrolls in Ouachita Parish total over $8 million. The vast majority of workers are residents of Ouachita Parish. The estimated economic multiplier from the direct payroll is estimated to be greater than five.

The economic benefits of extending the landfill's life with the proposed expansion include continued royalty payments to the Parish and continued employment for numerous area residents.

The public interest will be protected by the continued employment of permanent and part-time local residents now working at the currently operated landfill, by the impact of employee salaries on the local economy, and by the payment of royalties and taxes to the Parish government. Ouachita Parish, will continue to receive revenues from the facility's operations for inclusion in the Parish's operating budget, as it now does for the existing landfill. If the facility is not expanded, the Parish's current landfill will reach permitted capacity and this economic benefit will be lost Employees and families will lose important income, and Parish residents may face tax increases or local government cutbacks and layoffs to cover revenue shortfalls. Although the facility currently has capacity, it is important that the landfill be allowed to reach the final elevation without requiring the removal of covers and extension of gas wells. This unnecessary cost would have to be passed on to the customers of the facility. Thus, it is most economical and does not increase any environmental impacts to vertically expand the site at this time.

Magnolia RDF does not foresee any increase in public costs for police, fire protection, medical facilities, or emergency response equipment and facilities. These costs are decreased because the facility is self-sufficient in this area and because of its ability to assist others. The facility has on site emergency response capabilities. The facility will implement a contingency plan that sets forth procedures to be filed in reporting emergencies; coordinate notification and response actions; and respond to specific emergencies, including fires, explosions, spills and material releases. Additionally, each treatment, storage or disposal process at the facility has built-in control features, containment structures, and equipment to facilitate emergency response actions. The contingency plan further provides for: communication and coordination with off site emergency personnel including the Police Department, Fire Department, Louisiana State Police, and the Department of Environmental Quality; a site evacuation plan; local community evacuation and notification; and post-emergency-procedures.

Neither the existing site nor the expansion will preclude economic development of the area by business or industry. Over 70% of the surrounding areas are undeveloped-forested land. Only an estimated 2% of the area within a three-mile radius of the site is residential. Thus, businesses likely to locate facilities in the adjacent area are ones that primarily cater to other businesses. The presence of a solid waste landfill will not preclude other business operations. Contrarily, if a potential business generates a solid waste byproduct, it would be beneficial for it to locate near the landfill.

The site is located near a major US highway and interstate. This was a factor in siting the current operation since trucking is the primary mode of transportation used at the site. Based on correspondence from the Louisiana Department of Transportation and Development (DOTD), traffic associated with current operations at the Magnolia RDF is not having an adverse impact on area roadways. Since annual waste receipts are not projected to increase significantly and the expansion area is simply continuing the current operation, road traffic is not expected to increase. Thus, the quantity and weight of trucks should not create any additional impact on area roads. The geographic service area of the facility will remain unchanged with this expansion.

The social and economic benefits of the proposed vertical expansion outweigh any environmental impact costs.

(3) The alternative projects to the proposed activity, which would offer more protection to the environment without unduly curtailing non-environmental benefits.

The utilization of alternative methods of disposal has been studied. Although alternate technologies are available, no other technology is economically viable while providing the maximum environmental benefits. Furthermore, all available alternatives generate a residual that must be land-disposed. Most importantly other potential projects must be compared to environmental impact costs of vertically expanding an existing facility. Since the additional environmental impacts of vertically expanding the current site are negligible, alternative projects, although discussed herein, cannot offer more protection to the environment without unduly curtailing non-environmental benefits. Furthermore, implementation of a different technology would require significantly more capital, extensive permitting and siting efforts, and much higher operating costs. This, in turn, would cause the economic viability of the project to diminish resulting in locally generated wastes being shipped to other landfills located much farther away, impacting more residents through increased truck traffic, higher costs, and reduced economic benefits without any increase in environmental benefits.

Before the selection of the current site, other locations were considered. It was determined that the current site maximized the non-environmental benefits and minimized the potential environmental impacts. A vertical expansion at the most preferable site clearly is more advantageous than the selection of a new site. A summary of the analysis of alternate technologies and sites is provided as follows:

Incineration, resource recovery, and composting are existing alternatives that are discussed below.

(1) Incineration

Although municipal solid waste has a relatively high BTU content, development of this type of project requires considerable capital and a long period of time to implement, due to design and regulatory requirements. There are very few successful municipal waste incineration operations in this region of the country.

Slagging is often a problem causing extensive down times, as well as achieving a thorough mixing and even flow of material into the primary combustion chamber. The non-homogeneous nature of municipal waste makes the smooth operation of an incinerator very difficult. In addition, increasingly stringent emission requirements have resulted in the closure of a number of these projects.

Cases where municipal waste incinerators have been successful typically are areas where land costs are very high and a market exists for generated steam, in many cases it is necessary to sell steam from the process to make it economically viable. Without an industry nearby that uses large amounts of steam, this can be a major economic impediment to an incinerator's success. The area in and around Ouachita Parish does not have a concentrated industrial market for generated steam thus minimizing the economic viability of an incinerator in the area.

Other technical problems include raising tremendous amounts of capital to finance such a project and the relatively long time to implement this type of operation. Historically tipping fees for incinerators have been much higher than for sanitary landfills as evidenced by the small number of economically successful incinerator operations. Another important consideration is that even with an incinerator in full operation and compliance, the need for a well engineered and secure sanitary landfill will always exist for the incinerator ash and those items that cannot be safely incinerated.

(2) Resource Recovery/Waste to Energy

Evolving in the U.S. in the late 1960's, resource recovery has not been demonstrated to be a reliable and cost effective technology. The reasons for its failures are similar to those described for incineration. As with incineration technology, resource recovery designs are highly complex, borrowing many unit processes which have not been specifically designed for waste processing.

The economic viability of resource recovery is dependent on the scrap materials market, which has been severely depressed for the last few years.

If the plant is designed to produce an RDF (Refuse Derived Fuel) product, highly skilled personnel are required to achieve the necessary specifications on the end product. In addition, the markets for the product must be set up, preferably by contract, well in advance of actual construction. Businesses that use boilers in their manufacturing process are reluctant to enter into these contracts because it not only involves expensive retrofitting of their boilers but also a long term obligation to buy a minimum amount of an unconventional fuel.

Again the time required to site, design, build and put online a resource recovery plant is far longer and more expensive than expanding an existing landfill. As with incineration, a resource recovery facility does not preclude the need for a secure sanitary landfill for the disposal of those fractions that cannot be recovered or utilized as a fuel. Long-term disposal needs will always require a sanitary landfill as part of the plan.

(3) Composting

This disposal alternative is widely used in Europe where a majority of the research has been done. European refuse composition better lends itself to such a practice, while American refuse has a higher percentage of aluminum, plastic, and rubber which does not readily decompose and therefore makes a poor compost mixture.

The limited market for compost creates a major obstacle to the viability of this option. Far more compost is produced than what can be used, even in a highly agricultural area.

Though the technology for this option is not as complicated as the previously discussed options, it can be difficult to achieve and maintain optimum detention times, temperatures, and thorough mixing so as not to kill off the organisms that create the mechanism for decomposition.

And finally, as with all other disposal options, composting would still necessitate a sanitary landfill for those fractions that cannot be composted.

(4) Landfilling

It should be noted that the use of a sanitary landfill at this time does not prevent the addition of another disposal option in the future should the citizens so choose, whereas the commitment to another disposal option without thorough consideration will preclude all other technologies (except landfills) simply because of the significant capital outlay and long-term nature of such an alternative. The time required to adequately study and select a technology other than landfilling is much longer than the time available to replace the existing disposal site. It has been well documented that safe and secure sanitary landfills will always be needed for ultimate disposal no matter what other disposal technology may be used in conjunction. A sanitary landfill is not only the most practical immediate solution to disposal needs but also the most economical long-term alternative.

Landfill development is the only option that has been proven to be reliable, environmentally safe, and economically feasible for meeting the long-term disposal needs of the area. The development of a state-of-the-art landfill expansion, as described in this permit modification, will provide the most cost-effective disposal option for the citizens of Ouachita Parish, while benefiting the Parish economically as well. The Magnolia RDF fits into an overall integrated waste management system that offers a wide variety of treatment, recovery, incineration and disposal options, if such alternatives become viable in the future.

Former disposal areas operated by the Parish were required to close or upgrade after promulgation of RCRA Subtitle D regulations. According to the *Solid Waste Management Plan,* dated March 1994, developed by the Louisiana Department of Environmental Quality (LDEQ), the number of landfills operating in Louisiana decreased from 850 open dumps in 1981 to less than 30 landfills that are currently permitted. The facilities nearest to the Magnolia RDF that are currently in operation and permitted to accept municipal and industrial solid waste are LaSalle-Grant Landfill (Type I, Jena, LA), and Webster Parish Landfill (Type I, Minden, LA), These facilities do not offer more protection to the environment than the proposed expansion to the existing Magnolia RDF, and the use of these facilities to replace the Magnolia RDF would curtail non-environmental benefits (reasonable disposal cost) because there would be less competition in the solid waste market. This would likely result in an increased cost of disposal to the general public and industry. Furthermore, neither of these facilities can accept industrial waste. Not having an economical facility for the disposal of non-hazardous industrial waste could potentially curtail economic development in the area. In addition, use of the alternate sites would result in increased transportation costs and risks to the public. Travel to these sites would require the use of heavily traveled roadways and/or the use of substandard two lane roads. The additional impacts of using alternate sites far outweigh the risks of expanding an existing site.

During the siting of the current site, the location was selected due to the proximity of the US highway and interstate, availability of affordable land, and central location for the project service area. Other sites considered at the time did not offer the same level of commercial viability and environmental protection. For this vertical expansion, a review of alternate sites as in the case of a new facility is not appropriate. No new land area is being utilized in the proposed expansion and the maximum height of the facility is not being increased. This modification more efficiently utilizes the existing footprint by changing side slopes. Notwithstanding the foregoing, the proposed continuation of the existing site is most protective of the environment because the attributes of the property (geology, hydrology, etc.) are known to be protective of the environment. Accordingly, the expansion of the existing facility will continue to offer better location characteristics than alternate existing or new sites. As stated above, vertically expanding an existing facility in lieu of siting a new facility on virgin land minimizes potential impacted areas.

No practicable alternative to the proposed siting of this facility is known that would ensure that the cost-effective and environmentally sound disposal of solid waste would be available on a long-term basis for the residents of Ouachita Parish and surrounding areas. In evaluating this proposed expansion to the existing facility, it is important to note that no new land areas will be impacted and the maximum height will not be increased.

Furthermore, since the proposed facility is an expansion of the existing the Magnolia RDF, the site will utilize the existing site infrastructure, including roads, buildings, pipelines and treatment facilities. Impacts to the adjacent areas have been realized through the development of the existing facility, and any additional impacts will be minor. The selection of an alternate site would preclude the project, since the construction of site infrastructure at a new location would be cost prohibitive and the economic model would not be workable.

The US Army Corp of Engineers (COE) has inspected the site on several occasions. The COE visited the originally-permitted site in 1985 to determine if wetlands were present. The site was determined to be free of wetlands. In a letter dated May 21, 1985, the COE determined that the proposed landfill would not require a Department of the Army Section 404 permit based on their review of available information and their on site inspection the site.

In a letter dated June 14, 1984, the Louisiana Department of Culture, Recreation and Tourism, Office of Cultural Development indicated that there were no known archaeological or historical sites within 1,000 feet of the site. However, the proximity of recreational areas to the site was not addressed in this correspondence. This agency was re-contacted regarding the location of recreational areas (along with any additional information regarding the location of historical and archaeological sites) in the area of the Magnolia RDF. In a letter dated August 12, 1993, the Office of Cultural Development indicated that there were no known or recorded archaeological sites or historical structures within 1,000 feet of the site which confirms the original findings of their office.

In a letter dated June 24, 1984, the Louisiana Department of Wildlife and Fisheries (DWF) indicated that no known threatened or endangered species of animal existed at the site. However, an ecologically sensitive area (Russell Sage WMA) is present in the immediate vicinity of the site. The Russell Sage WMA lies immediately east of the site, but is separated from the landfill property by a buffer zone, the facility perimeter levee, and a private road with drainage ditches on both sides. The DWF requested to review the operational plans of the landfill facility in order to evaluate adverse impacts (if any) to the management area by the operation of the landfill. In a letter dated October 22, 1984, the Louisiana DWF concluded that proper operation of the landfill facility would not have any adverse impacts on the management area. The proposed vertical expansion will not involve additional land areas.

Existing land use within a three-mile radius of the Magnolia RDF has been estimated based on available maps, published information, an area visual reconnaissance, and through general knowledge of Ouachita Parish and the surrounding area. Based on this information, the land use for the area within a three-mile radius of the facility, by approximate percentages, is as follows:

residential - 2%
health care facilities & schools - <1%
agricultural - 20%
industrial/manufacturing - 3%
other commercial - 5%
recreational - 25%
undeveloped (forested land) - 45%

Note: The approximate 25% land use representing recreational area is the Russell Sage Wildlife Management Area which is located east and southeast of the landfill. The category of land use representing undeveloped land (45%) can be better described as forested areas. As demonstrated in a letter from the Ouachita Parish Police Jury, local or parish land use/zoning ordinances do not exist that preclude the location and operation of a landfill in the area of the Magnolia RDF.

The disposal area is protected, as a precautionary measure, from flooding by a perimeter levee system constructed to an elevation of 2 feet above the level of the 100-year flood which will provide protection against wind speeds greater than 80 miles per hour. The levee also prevents any migration of leachate or surface water from the active landfill area onto adjacent areas. Correspondence from the COE dated October 24, 1984 indicated that the site would have a negligible impact on the Bayou Lafourche flood stage. However, this letter also indicated that fill material placed at this site would cross a natural depression that drained an auxiliary outlet of Gourd Bayou, that blockage or significant encroachment into this floodway could raise flood stages upstream, and efforts would need to be made to compensate for any blocked drainage or encroachment into the floodway. In a letter dated January 25, 1985, the COE reiterated its point that the site would have insignificant impact (less than 0.1 foot) on Bayou Lafourche flooding. This letter went on to state (in regards to the blockage on the Gourd Bayou floodway), that the COE suggests the perimeter ditch of the landfill have the equivalent or more flowage as a 48-inch corrugated metal pipe (CMP) of a nearby roadway and that the perimeter ditch be maintained to prevent vegetation from decreasing the flow capacity

No development is proposed for this site that would result in a reduction of the storage capacity of the flood zone. This ditch has been installed and maintained. Vertically expanding an existing facility will not have any impact on flood conditions.

The perimeter ditch system at Magnolia RDF is designed to accommodate the discharge from the design standard of 8 inches of rainfall (based on a 25 year/24 hour storm) following closure of the landfill, which is when the peak discharge will occur. The surface water drainage system has been sized for this event.

Additional environmental protection is provided by several measures to maximize environmental protection. The facility will not accept hazardous waste and has strict procedures to prevent their inadvertent receipt. Thus, existing community health problems, if any, would not be aggravated by the operation of the facility.

The current operation has been -ongoing for over 15 years and there have been no documented incidents that the facility poses adverse health risks.

The proposed technology is currently considered "state-of-the-art" for solid waste landfill design. Engineering design improvements allow for a facility footprint that maximizes volume per square foot and minimizes the impacted area. Other facilities in Louisiana require significantly greater areas to accommodate similar volumes.

The use of composite lining systems that include 60-mil HDPE flexible membrane liners in conjunction with recompacted clay has proven highly effective and reliable in controlling potential environmental impacts and protecting shallow groundwater. In addition, leachate head within a cell is required to be maintained at no more than one foot. Thus, there is little hydraulic gradient to encourage flow out of a cell. The facility is monitored by groundwater monitoring wells located along the perimeter. Historical groundwater monitoring data for Magnolia RDF indicates that no impact has occurred to date from operation at the facility.

Record keeping is routinely and properly maintained to effectively manage the operation and to prepare the necessary reports in accordance with the administrative requirements of the State. Upon arrival at the site, all vehicles with incoming wastes, with the exception of in parish residents, are instructed by signage to stop at the facility gatehouse. The gatehouse is equipped with a central control and record keeping system for tabulating information on the wastes. Utilizing scales, the system records the quantity (by wet-weight tonnage); sources (whether the wastes were generated in-state or out-of-state and, if it is industrial solid waste, where it was generated); and types of incoming wastes (i.e., industrial, commercial, residential). Industrial waste will be compared to the pre-acceptance information and checked for conformity. In the event of scale malfunction, the amount of waste is estimated and recorded in cubic yards, and the scale is repaired as soon as practicable. Parish residents drop household waste for free in cans, and then the cans are weighed and included in the waste totals.

The waste delivery and recording system, in conjunction with the facility security system, allows only limited and controlled access to the disposal area. The controlled and documented entry along with the random inspection of incoming waste loads will reasonably ensure exclusion of prohibited wastes. Facility personnel receive training in regulatory compliance, which provides a review of applicable state regulations with emphasis on the facility solid waste permit. Certified facility operators receive additional training on regulatory compliance during scheduled meetings conducted by the Board of Certification and Training for Solid Waste Disposal System Operators and the LDEQ Solid Waste Division.

Facility personnel will randomly: (1) inspect the load to verify that the waste has the physical appearance indicated on the previously approved documents and conforms to the type of waste accepted (e.g. industrial, commercial, or residential); and (2) make an entry in the site's record keeping system indicating the generator, waste name, vehicle number, time, date, volume, and location of deposited waste in the landfill by referencing the site grid coordinate system. Additionally, the physical verification may entail obtaining a sample of the waste from each truck entering the site.

Commercial collection vehicles are not allowed to proceed into the landfill until authorized. The truck is logged in and directed to the unloading area. For industrial wastes, the receiving ticket is completed noting the location where the wastes are deposited. During unloading, the waste is visually monitored by the operator. If any potentially hazardous waste is detected, the vehicle is not allowed to leave the site until the disposition of such waste is resolved.

Small non-commercial vehicles are typically allowed to dispose of waste in containers near the entrance gate to avoid traveling into the tipping area. This area is identified as the "Non-commercial Small-vehicle Container Area." These containers, when filled, are hauled to the tipping area for disposal. The location of the "Non-commercial Small-vehicle Container Area" may be changed as needed to accommodate facility operations. The facility allows parish residents free disposal of household wastes.

Vehicles entering the facility are weighed or measured prior to entering the disposal area. Upon completion of acceptance procedures described in the Quality Assurance and Quality Control Program for Waste Acceptance, the vehicles are directed to either the active disposal area or the non-commercial small-vehicle container area. Haulers not familiar with the facility are provided with verbal instructions and their loads are closely checked for the specific acceptance requirements. Properly placed signs instruct drivers as to speed limitations, site precautions, movement of traffic and directions to the working face of the active landfill cell to facilitate uniform traffic flow.

Industrial process solid wastes that require improvements in their physical characteristics for ease in handling are mixed with a solidification agent or other non-hazardous wastes (e.g. fly ash, kiln dust or similar products). The handling, mixing and details of disposal schemes are evaluated by means of physical testing.

Solid wastes difficult to compact may require mixing with sand, silt, clay or other material. The proper mix is determined by physical testing in the laboratory and/or by field demonstration.

Trash delivered to the site in loose form and containing items such as appliances or bulky containers may be segregated and recycled or reused. Open burning of refuse is not practiced at Magnolia RDF as a waste handling method. Additionally, no solid waste shall be deposited in standing water and all waste will be deposited in the smallest practical area, spread and compacted in layers approximately two feet thick, or, if baled, will be stacked and covered daily.

The waste acceptance and testing procedures for receiving domestic sewage sludge, industrial solid waste, incinerator ash or non-hazardous petroleum contaminated media and debris generated by underground storage tanks corrective action have additional waste acceptance requirements under Louisiana Administrative Code 33:VII. Solid Waste Regulations, including Sections 521, 709, and 711. The program specifically provides preacceptance procedures to determine the acceptability of a waste pursuant to facility permit conditions, operational capabilities, and state and federal regulations.

The general development of each cell is to reach approximate final grades within a cell prior to filling within the next cell. This may be highly dependent on site conditions and weather conditions at the time these elevations are reached. The unloading area is maintained to facilitate side-by-side unloading, when practical, without undue delay due to equipment operations. As the permitted height is attained, interim cover and interim compacted cover is placed over the appropriate sections of the disposal area.

A major site development objective is to manage the refuse filling activities such that the finished grades are achieved on a progressive basis, then final-covered and vegetated as soon as practical. In this way, closure takes place throughout the life of the site and no area which has been brought up to final grade will remain without the required final cover longer than necessary. Thus, it is advantageous to have this vertical expansion implemented at this time so that the interim or final cover need not be removed.

Within a few months after final cover is applied, the area will be seeded. Areas which are covered, closed, and are growing vegetation will be maintained in an aesthetically pleasing manner. Periodically, areas that have received final cover and have been vegetated will be inspected for spongy spots, erosion, vegetative stress, etc. These areas will be repaired as necessary.

The final cover placed on the landfill will be maintained for 30 years after closure. Maintenance activities will include maintenance of vegetative cover, as needed, and inspections of the cover for evidence of burrowing, erosion, settlement, subsidence, or other events. If any problems with the cover are noted, they will be subsequently repaired to maintain the integrity of the cover.

The gas collection and treatment or removal system and gas-monitoring system are maintained and operated throughout the post-closure monitoring period until gas production reduces to minimal levels. Additionally, the groundwater monitoring system will be maintained and monitored during the 30-year post-closure period.

Any solid waste generated during the closure operation will be disposed in the remaining disposal area. Upon final capping of all on site disposal areas, residuals will be stored in containers and transported off site for disposal.

The operations at a sanitary landfill have a very low potential for creating toxic air emissions. The decomposition of non-hazardous solid waste generates methane and a small fraction of other compounds. In accordance with EPA guidance, it is estimated that landfills that receive municipal and industrial waste have a non-methane fraction of approximately 0.4 %. Currently these emissions are controlled through an extensive gas collection and control system. The system consists of a series of gas collection wells networked to a flare. The flare(s) or reciprocating engine(s) will consume the generated methane and other trace compounds and reduces their emissions by over 75%. This will result in the expanded operation having significantly less emissions than the current operation.

Odors (and emissions) will be controlled through the application of daily cover over the working face of the landfill. As areas reach the design elevations, interim and final covers are installed.

Due to the low potential for air emissions and variable winds, a designated population group that would be affected by potential air emissions from the facility could not be identified. A "bad air" condition caused by site operations is not likely to occur.

As described above, air emissions will be controlled through the use of a daily cover and the use of a gas control system. The gas control system is installed as each area reaches it final elevation.

A comprehensive geotechnical investigation and consideration of site geology, hydrology, topography, soil properties, aquifer locations, and potential subsidence have been incorporated in the design of the vertical expansion such that the facility will continue to be protective of the environment as well as comply with all state and federal regulations governing solid waste disposal facilities.

The effects of climatic conditions for the site have also been studied. Protections against flooding, catastrophic events (hurricanes, tornadoes, and fires) have been included in the facility design. Designed features include buffer zones, protection levees, drainage ponds, proper sloping, and reduced working faces.

The facility has a detailed Quality Assurance and Quality Control (QA/QC) Plan for Waste Acceptance. The QA/QC plan specifically provides for pre-acceptance procedures to determine the acceptability of a waste pursuant to facility permit conditions, operational capabilities and state and federal regulations. The program sets forth procedures to monitor incoming loads and verify that the incoming waste corresponds with pre-acceptance waste characteristics and provisions in the facility permit.

Pre-acceptance procedures determine the acceptability of a waste or waste stream to ensure that it does not contain hazardous waste or free liquids. The generator must provide pertinent physical and chemical data as well as other information detailed in the plan. Based on the pre-acceptance information, the stream will either be accepted or rejected for disposal.

Once approved for disposal, the generator can schedule disposal. Upon arrival at the site, the shipment will be weighed and the driver's documentation will be reviewed. In addition, facility personnel will randomly inspect that the waste to ensure the material has the physical characteristics indicated on the approved pre-acceptance information. In addition, random inspections will also occur in the area of the working face to ensure that potentially hazardous material is not being received. "Fingerprinting" methods will also be performed on selected waste using the pre-acceptance information. Methods may include but are not limited to color, texture, pH, paint filter testing, etc. Any load that fails "fingerprinting" will be rejected and returned to the generator. The generator will also be notified of the waste discrepancy.

If it is later determined that a non-conforming waste was placed in the landfill, the load or loads will be retrieved from the cell. Since the locations of all industrial wastes are noted in the operating record, the procedures in the QA/QC plan, for "Waste Rejection and Removal Plan" will be implemented. .

Although, the government has not developed a formal integrated waste management system, Magnolia RDF is part of an integrated waste management system serving the local and regional communities. This facility has been planned with the full knowledge of Ouachita Parish government, which receives royalties from the facility.

As the economic environment continues to improve for waste reduction, recovery and recycling, the need for "state-of-the-art" strategically-located sanitary landfills will continue for the proper disposition of the residuals that do not have economic value. As the local community and the state develop more comprehensive waste management plans, Magnolia RDF will continue to serve an integral role by providing economically and environmentally sound disposal and allow the implementation of a formal plan to proceed rapidly.

As set forth above, alternative projects to the proposed vertical expansion would not offer more protection to the environment without unduly curtailing non-environmental benefits. In conclusion, there are no alternative projects, which would offer more protection to the environment than the proposed facility.

LOCATION CHARACTERISTICS DOCUMENTATION

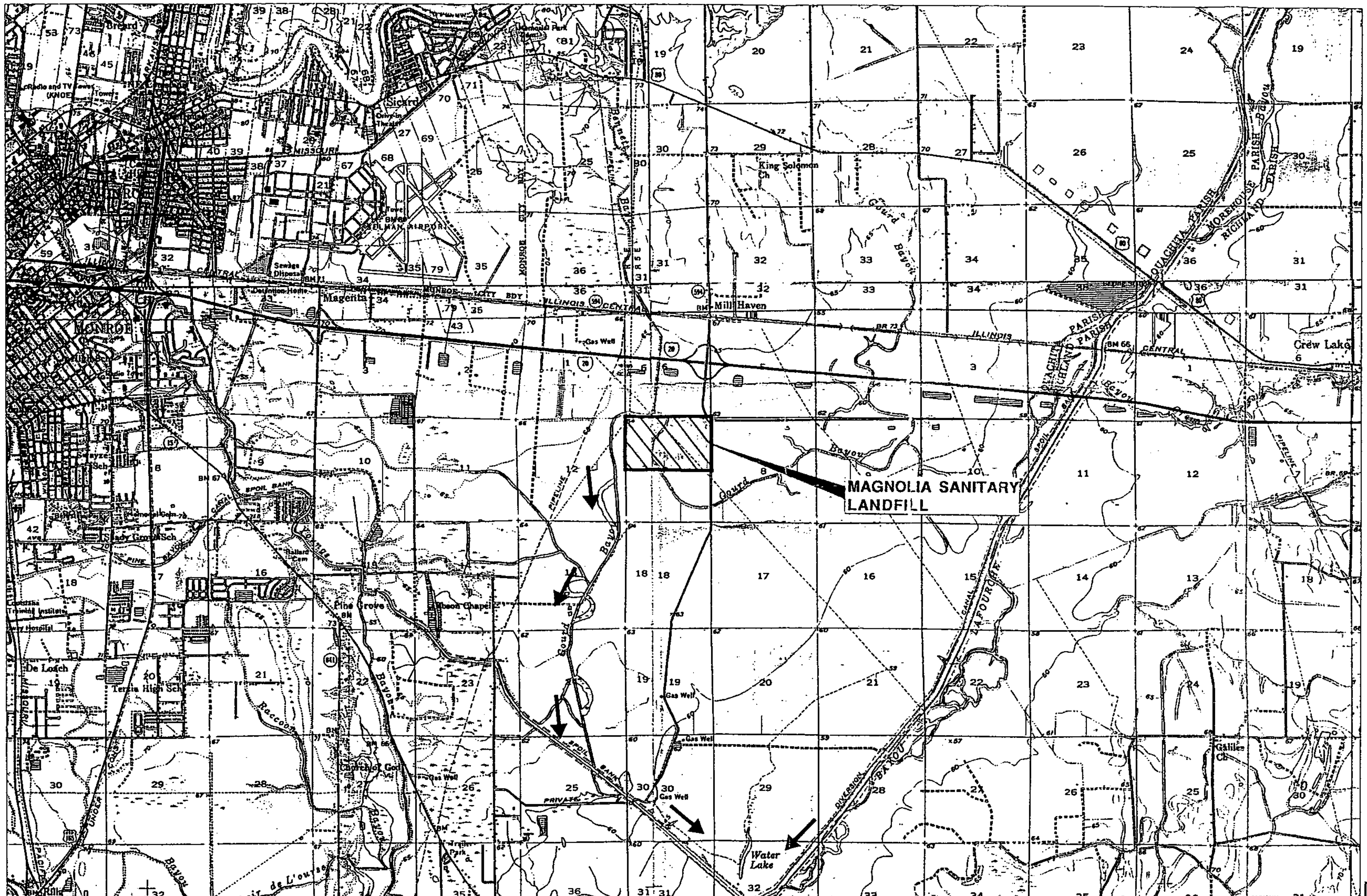
EXHIBIT A

AREA MASTER PLAN
(LAC 33:VII.521.A.1)

EXHIBIT A.1

LEGEND

- FLOW DIRECTION



SOURCE: USGS 15 MINUTE SERIES QUADRANGLE MAPS. MONROE NORTH (1998), MONROE SOUTH (1998), SWARTZ (1998), CREW LAKE (1998) LOUISIANA

DATE	DESCRIPTION	BY
REVISIONS		

AREA MASTER PLAN
MAGNOLIA SANITARY LANDFILL
WASTE MANAGEMENT OF LOUSIANA

AUGUST. 2005

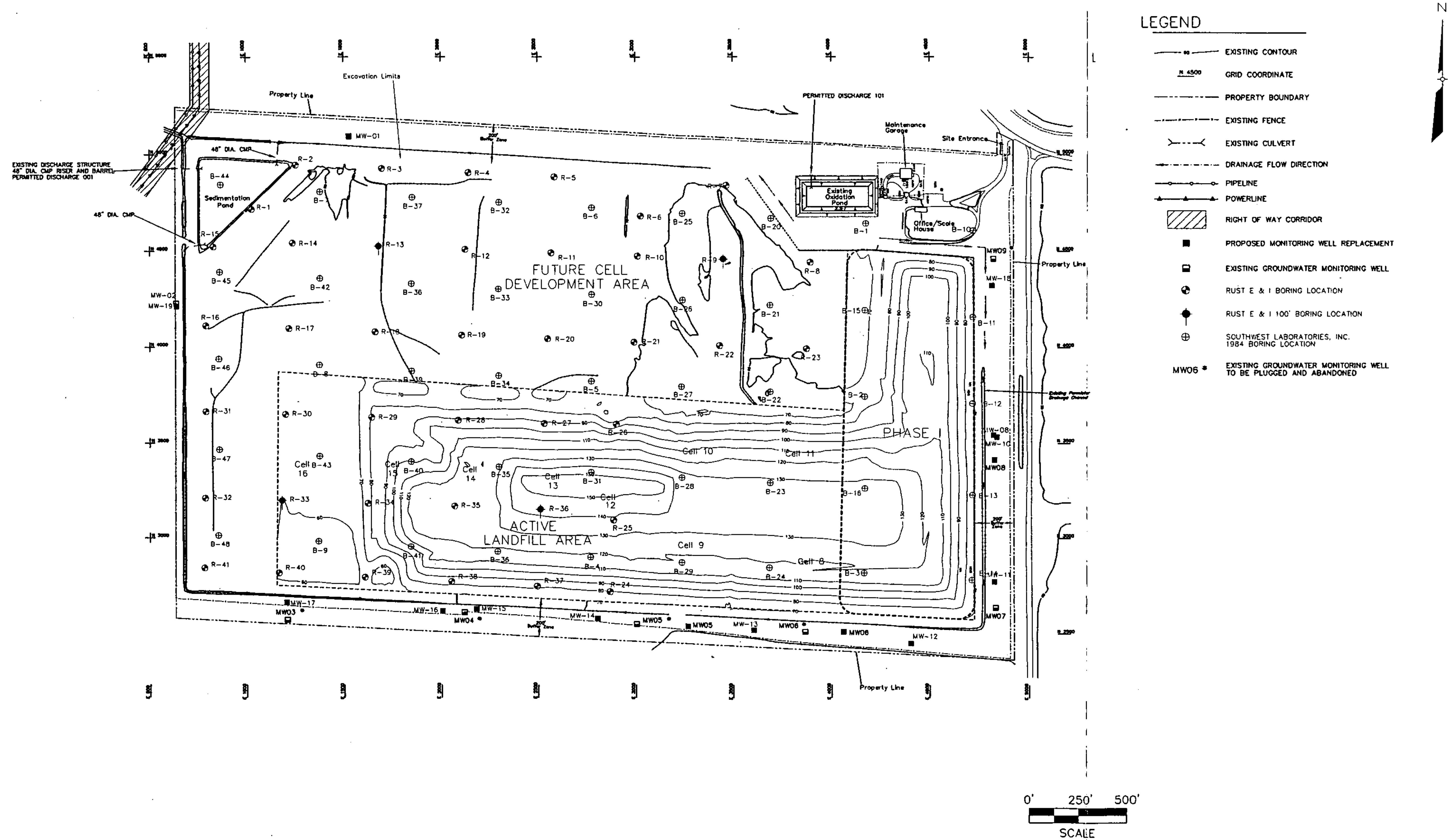
WM WASTE MANAGEMENT

SIGMA ENGINEERS & CONSTRUCTORS

DESIGNED	DRAWN	CHECKED	APPROVED
DLS	DOH		

SITE MASTER PLAN

(LAC 33:VII.521.A.1; 521A.2.C; AND 521.B.1)



RE: Drawing created from Existing Site Plan Project No.86415, file 86415.DWG.

Drawn By: ARDIS	5/99		Project No.	42891.010	4/2001	1	VERTICAL EXPANSION	DLS
Designer: BLACKMAR	5/99		Drawing No.	42891A01.DWG				
P.E. BLACKMAR	5/99		Date Issued:	04-24-01				
Approved: BLACKMAR	5/99		Plot Time:	3:57 P.M.	DATE	NO.	REVISION	BY

WASTE MANAGEMENT

PREPARED FOR

EARTH TECH

Baton Rouge, Louisiana

PREPARED BY

EXHIBIT A.2

SITE MASTER PLAN

MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA

APRIL 2001

42891.01

LOUISIANA DOTD LETTER REGARDING
ROADWAY IMPACT
(LAC 33:VII.521.A.1.B AND 709.A.1)

EXHIBIT A.3

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
P.O. Box 4068, Monroe, Louisiana 71211-4068
(318) 342-0100
Fax: (318) 342-0260
www.dotd.louisiana.gov

KATHLEEN BABINEAUX BLANCO
GOVERNOR

JOHNNY B. BRADBERRY
SECRETARY

June 10, 2005

Ms. Susan N. Douglas
Sigma Engineers & Constructors, Inc.
10305 Airline Highway
Baton Rouge, Louisiana 70816

Dear Ms. Douglas:

The highway which provides access to the Magnolia Sanitary Landfill is the responsibility of the Louisiana Department of Transportation and Development. The highway was constructed in accordance with the Department's standards and is adequate for routine traffic, including the solid waste collection vehicles. The traffic associated with the Magnolia Sanitary Landfill will not have an adverse traffic impact on area roadways.

Sincerely,

D.L. TOLAR, P.E.
DISTRICT ADMINISTRATOR

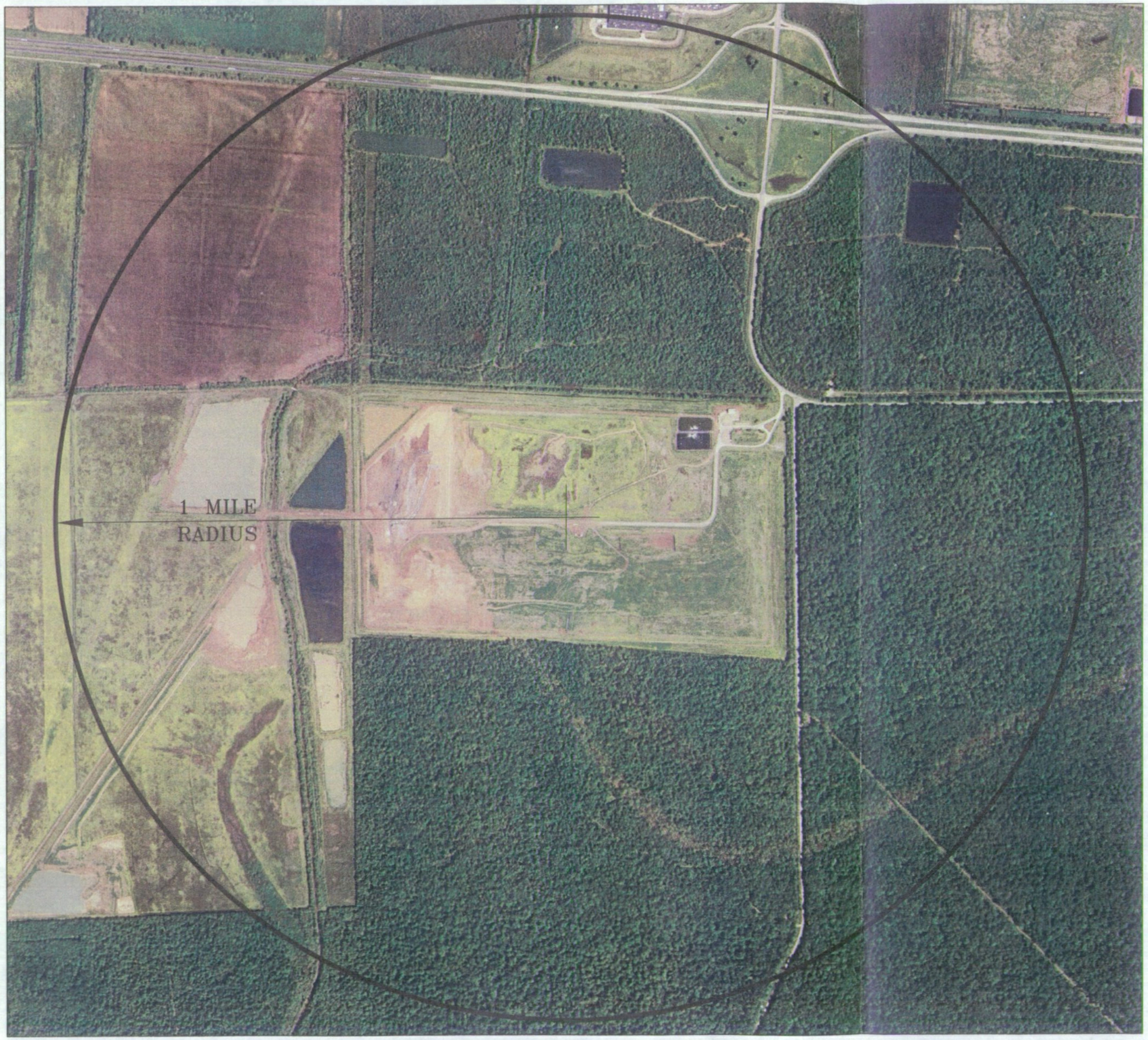
R. KIRK GALLIEN, P.E., P.T.O.E.
DISTRICT TRAFFIC OPERATIONS ENGINEER

RKG/ll

AERIAL PHOTOGRAPH
(LAC 33:VII.521.A.1.D)

EXHIBIT A.4

EXHIBIT A.4



NOTES:

REFERENCE:
AERIAL PHOTOGRAPHY 4/15/2005
SOUTHERN RESOURCES MAPPING CORPORATION
SRMC #07205m

SCALE 0' 575' 1150' 2300'

DATE	DESCRIPTION	BY

REVISIONS

AERIAL PHOTOGRAPH
MAGNOLIA SANITARY LANDFILL

MONROE, LA — OCTOBER, 2005

WM WASTE MANAGEMENT — SIGMA ENGINEERS & CONSTRUCTORS JOB NO. 40808

DESIGNED	DRAWN	CHECKED	APPROVED
	DLS		

DEPARTMENT OF CULTURE, RECREATION AND TOURISM LETTERS REGARDING ARCHAEOLOGICAL AND HISTORICAL SITES (LAC 33:VII.521.A.1.E AND 709.A.3)

SIGMA
ENGINEERS &
CONSTRUCTORS, INC.
A SIGMA COMPANY IN ASSOCIATION WITH SIGMA CONSULTING GROUP, INC.

INDUSTRIAL, ENVIRONMENTAL, STRUCTURAL, MECHANICAL, PROCESS, ELECTRICAL, INSTRUMENTATION

Stephen J. Brasuell, P.E.
President

Michael N. Dooley, M.B.A., P.E.
Vice-President

Paul R. Schneider
Vice-President

Daniel B. Kais, P.E.
Vice-President

Date: 6-30-05
No known archaeological sites or histori
properties will be affected by this undertaking
This effect determination could change shoul
new information come to our attention.
Pam Breaux: Pam Breaux
State Historic Preservation Officer

June 2, 2005

Ms. Pam Breaux
Louisiana Department of Culture, Recreation & Tourism
Office of Cultural Development
P.O. Box 44247
Baton Rouge, Louisiana 70804-4247

Dear Ms. Breaux:

RE: Magnolia Sanitary Landfill
Monroe, Ouachita Parish

Sigma Engineers & Constructors, Inc., on behalf of Waste Management of Louisiana, LLC, respectfully requests your review and response regarding the presence of any listed National Historic Register sites proximate to the Magnolia Sanitary Landfill. Our request for an updated response is made pursuant to the Magnolia renewal application for a solid waste permit. Previous responses provided by the Louisiana Department of Culture, Recreation and Tourism dated July 16, 1984 and August 12, 1993 are attached. The facility is located off of Louisiana Highway 594 approximately one half mile south of Interstate 20. A site location map is attached.

Thank you in advance for your expedient handling of our request. Should you have any questions please contact me at (225) 298-0111, Extension 156.

Very truly yours,
SIGMA ENGINEERS & CONSTRUCTORS, INC.

Susan Douglas

Susan Douglas

Attachment
c: M. Noel
50504 File

RECEIVED
JUN 6 2005
DIV. OF ARCHAEOLOGY

DEPARTMENT OF CULTURE, RECREATION AND TOURISM (OFFICE OF STATE PARKS) LETTER REGARDING RECREATIONAL AREAS (LAC 33:VII.521.A.1.E AND 709.A.3)

MITCHELL J. LANDRIEU
LIEUTENANT GOVERNOR

State of Louisiana

OFFICE OF THE LIEUTENANT GOVERNOR
DEPARTMENT OF CULTURE, RECREATION & TOURISM
OFFICE OF STATE PARKS

ANGÈLE DAVIS
SECRETARY

STUART JOHNSON, PH.D.
ASSISTANT SECRETARY

June 14, 2005

Ms. Susan Douglas
SIGMA Engineers & Constructors, Inc.
10305 Airline Highway
Baton Rouge, LA 70816

Re: Magnolia Sanitary Landfill
Monroe, Ouachita Parish
Solid Waste Permit Renewall Application

Dear Ms. Douglas:

The Office of State Parks has received your request. After review, there are no holdings of ours located within 1000' of the above-mentioned project. Therefore, further comment is not necessary.

If you need further assistance, please let me know.

Sincerely,

Kenny Lang
Assistant Chief of Resource Development

KL:dr

DEPARTMENT OF WILDLIFE AND FISHERIES LETTERS REGARDING ENDANGERED SPECIES AND WILDLIFE MANAGEMENT AREAS (LAC 33:VII.521.A.1.E, 521.C.1.A, 709.A.3; AND 709.A.B.III)

EXHIBIT A.7

State of Louisiana

KATHLEEN BABINEAUX BLANCO
GOVERNOR

DEPARTMENT OF WILDLIFE AND FISHERIES

DWIGHT LANDRENEAU
SECRETARY

Name	Susan Douglas
Company	Sigma Engineers and Constructors, Inc.
Street Address	10305 Airline Hwy
City, State, Zip	Baton Rouge, LA 70816
Project	Magnolia Sanitary Landfill-Monroe
Date	June 27, 2005
Invoice Number	05062710

Personnel of the Habitat Section of the Fur and Refuge Division have reviewed the preliminary data for the captioned project. In reviewing our database, no rare, threatened, or endangered species or critical habitats were found within the area of the captioned project that lies in Louisiana. Russell Sage Wildlife Management Area (WMA) is within 1/4 mile of the proposed project. Contact Jimmy Anthony with the Louisiana Department of Wildlife and Fisheries at 225-765-2347 to coordinate activities concerning WMA's. No other state or federal parks, wildlife refuges, scenic streams, or wildlife management areas are known at the specified site within Louisiana's boundaries.

The Louisiana Natural Heritage Program has compiled data on rare, endangered, or otherwise significant plant and animal species, plant communities, and other natural features throughout the state of Louisiana. Heritage reports summarize the existing information known at the time of the request regarding the location in question. The quantity and quality of data collected by the LNHP are dependent on the research and observations of many individuals. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in Louisiana have not been surveyed. This report does not address the occurrence of wetlands at the site in question. Heritage reports should not be considered final statements on the biological elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The Louisiana Natural Heritage Program requires that this office be acknowledged in all reports as the source of all data provided here. If you have any questions or need additional information, please call Louisiana Natural Heritage Program Data Manger Jill Kelly at (225) 765-2643.

Sincerely,

Gary Lester

Gary Lester, Coordinator
Natural Heritage Program

State of Louisiana

DEPARTMENT OF WILDLIFE AND FISHERIES
POST OFFICE BOX 15570
BATON ROUGE, LA 70895

J. BURTON ANGELLE, SR
SECRETARY
(504) 925-3617

EDWIN W. EDWARDS
GOVERNOR

October 22, 1984

Mr. Kevin D. Yard, Regional Engineer
Waste Management of North America, Inc.
East/South Central Region, Southwest District
7676 Hillmont, Suite 195
Houston, Texas 77040

Re: Ouachita Sanitary Landfill

Dear Mr. Yard:

We have reviewed the stipulations to the operation of the above referenced site which are designed to minimize impacts to our Russell Sage Wildlife Management Area. We feel that the letter accurately reflects our discussion and answers our primary concerns. Therefore, we do not expect any adverse impacts to our property resulting from the proper operation of the sanitary landfill facility.

We thank you for the opportunity afforded to us to discuss this facility's location and operation with you for your consideration of our views and concerns.

Sincerely yours,

M B Watson

M. B. Watson, Coordinator
Ecological Studies Section

MBW/fsb

SIGMA ENGINEERS & CONSTRUCTORS, INC.
A SIGMA COMPANY IN ASSOCIATION WITH SIGMA CONSULTING GROUP, INC.

INDUSTRIAL, ENVIRONMENTAL, STRUCTURAL, MECHANICAL, PROCESS, ELECTRICAL, INSTRUMENTATION

Stephen J. Brasuell, P.E.
President

Michael N. Dooley, M.B.A., P.E.
Vice-President

Paul R. Schneider
Vice-President

Daniel B. Kais, P.E.
Vice-President

October 25, 2005

Mr. Jimmy Anthony
Department of Wildlife and Fisheries
P.O. Box 98000
Baton Rouge, Louisiana 70808-9000

RE: Magnolia Sanitary Landfill
Monroe, Ouachita Parish
Solid Waste Permit Renewal Application

Dear Mr. Anthony:

On behalf of Magnolia Sanitary Landfill (Magnolia), per our conversation yesterday, I am submitting this notification that Magnolia is in the process of preparing a Permit Renewal Application for the facility located near Monroe, Louisiana. Correspondence received June 27, 2005 from the Louisiana Department of Wildlife and Fisheries (LDWF) required Magnolia to contact LDWF to coordinate activities concerning Wildlife Management Areas, specifically in this case the Russell Sage Wildlife Management Area.

As we discussed yesterday, the Magnolia renewal application does not include any design changes, expansions to the footprint, or changes to present ongoing operations at the site. You said that that time that with no changes, you had no objections. I would like to renew the offer to provide sections of the permit application for your review and/or files should that be helpful.

If you have any questions or need additional information please contact me at (225) 298-0111, Extension 156.

Sincerely,
SIGMA ENGINEERS & CONSTRUCTORS, INC.

Susan Douglas

Susan Douglas

c: M. Noel
50504 File

ARMY C.O.E LETTER REGARDING
WETLANDS LOCATION
(LAC 33:VII.521.A.1.F, 521.A.1.F, 709.A.4; AND 711.A.1)

EXHIBIT A.8

DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT, CORPS OF ENGINEERS
4155 CLAY STREET
VICKSBURG, MISSISSIPPI 39183-3435

REPLY TO
ATTENTION OF:

August 18, 2006

Operations Division

Ms. Susan Douglas
Sigma Associates, Incorporated
10305 Airline Highway
Baton Rouge, Louisiana 70816

Dear Ms. Douglas:

This is in response to your letter requesting a jurisdictional determination for the Magnolia Sanitary Landfill and property located within 1000 feet of the landfill property boundary located in section 29, T7N-R1E, Grant Parish, Louisiana.

Based upon the information provided, it appears that there are jurisdictional areas on the property subject to regulation pursuant to Section 404 of the Clean Water Act. The approximate extent of possible waters of the United States within the boundary of the property described in your letter is depicted on the enclosed preliminary map (enclosure 1). Any work involving the discharge of dredged or fill material (land clearing, ditching, filling, leveeing, etc.) within jurisdictional waters will require a Department of the Army Section 404 permit prior to beginning work. Please note that this determination is preliminary and should be used for planning purposes only. For your information, I am including a copy of our Appeals form (enclosure 2).

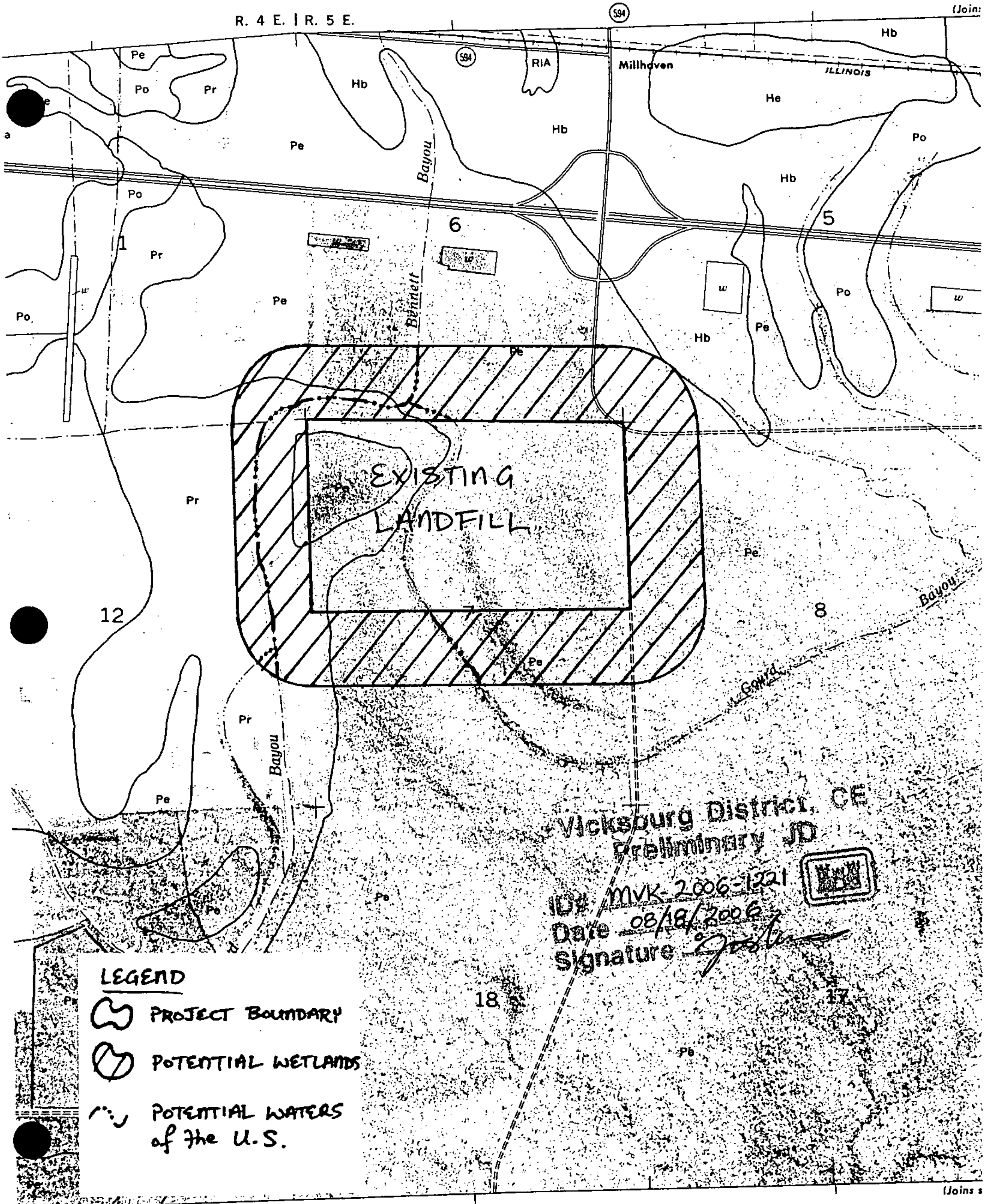
For your convenience, I am enclosing a Department of the Army permit application package with instructions (enclosure 3). Your application for any proposed work in wetlands or other waters of the United States should be submitted at least 120 days in advance of the proposed starting date. To expedite the evaluation process, please reference the identification number MVK-2006-1221 when submitting the application.

If you have any questions, please contact Mr. Joshua G. Carpenter of this office, telephone (601) 631-7815, fax (601) 631-5459 or e-mail address: Joshua.G.Carpenter@mvk02.usace.army.mil.

Sincerely,

Kenneth P. Mosley
Chief, Enforcement Section
Regulatory Branch

Enclosures


R. 4 E. | R. 5 E.
594
Millhaven
ILLINOIS
Hb
He
Pe
Po
Pr
RIA
Bayou
Bennett
Gourd
w
1
5
6
7
8
12
17
18
EXISTING LANDFILL
Vicksburg District, CE
Preliminary JD
ID# MVK-2006-1221
Date 08/18/2006
Signature
LEGEND
PROJECT BOUNDARY
POTENTIAL WETLANDS
POTENTIAL WATERS of the U.S.
(Joins

Enclosure 1

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: Waste Management of Louisiana, L.L.C.	File Number: MVK-2006-1221	Date: August 18, 2006
Attached is:		See Section Below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of Permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of Permission)	B
	PERMIT DENIAL	C
	APPROVED JURISDICTIONAL DETERMINATION	D
X	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations (JD) associated with the permit.

- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.

- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.

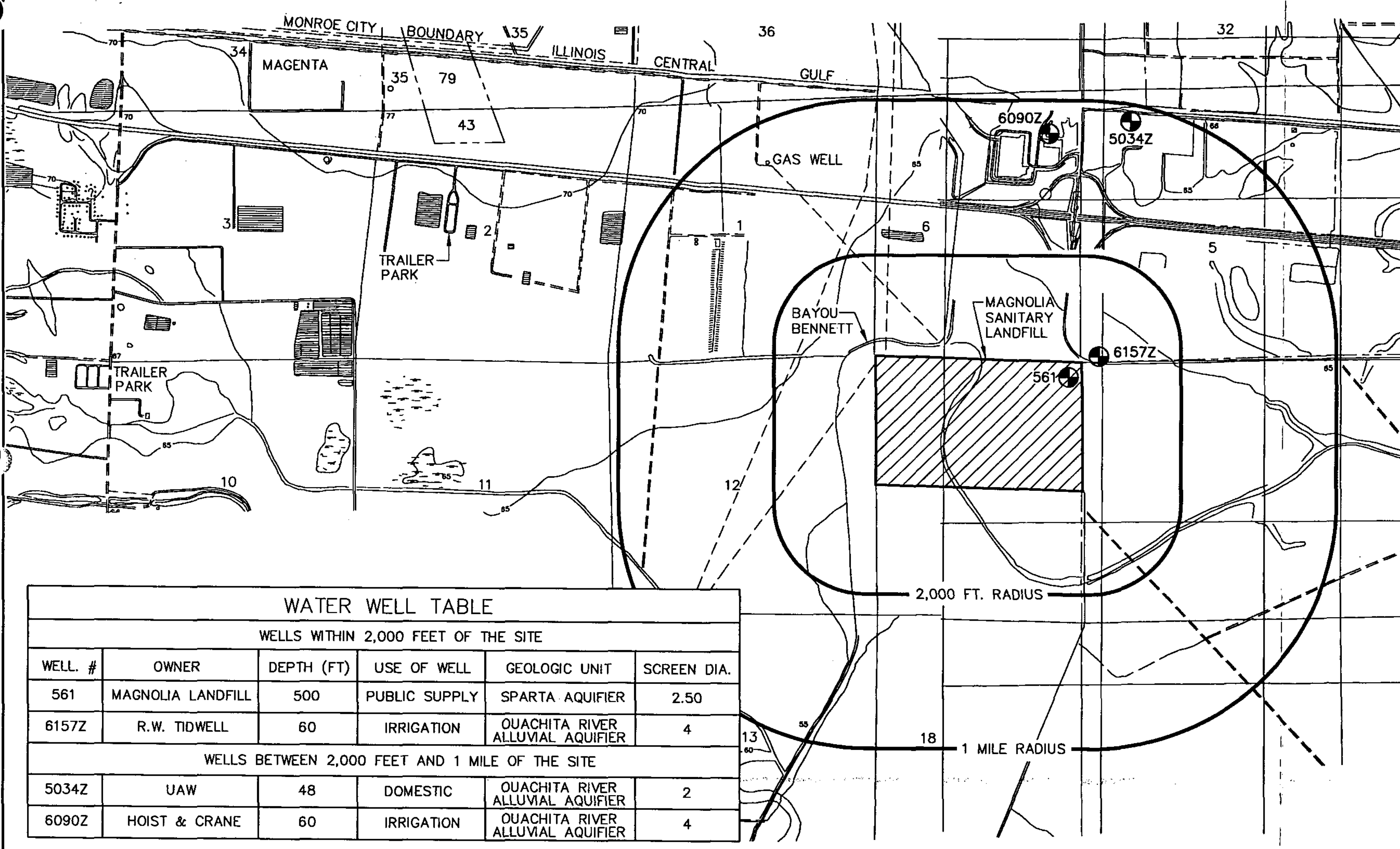
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

Enclosure 2

WATER WELL MAP/DOTD WATER WELL SURVEY AND DEPARTMENT OF NATURAL RESOURCES – OIL AND GAS WELL SEARCH

EXHIBIT A.9



WATER WELL TABLE

WELL. #	OWNER	DEPTH (FT)	USE OF WELL	GEOLOGIC UNIT	SCREEN DIA.
WELLS WITHIN 2,000 FEET OF THE SITE					
561	MAGNOLIA LANDFILL	500	PUBLIC SUPPLY	SPARTA AQUIFIER	2.50
6157Z	R.W. TIDWELL	60	IRRIGATION	OUACHITA RIVER ALLUVIAL AQUIFIER	4
WELLS BETWEEN 2,000 FEET AND 1 MILE OF THE SITE					
5034Z	UAW	48	DOMESTIC	OUACHITA RIVER ALLUVIAL AQUIFIER	2
6090Z	HOIST & CRANE	60	IRRIGATION	OUACHITA RIVER ALLUVIAL AQUIFIER	4

WATER WELL MAP
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
EXHIBIT A.9

OCTOBER, 2005

WM WASTE MANAGEMENT | SIGMA ENGINEERS & CONSTRUCTORS

DESIGNED	DRAWN	CHECKED	APPROVED
	DMD		

DATE	DESCRIPTION REVISIONS	BY

SHEET

F:\0707\2\5050\4\01800\WATER WELL MAP.DWG [Layout1] Oct 28, 2005 - 10:53am

Select Wells

Registered Water Wells

Public Works & Water Resources Division
Water Resources Section

Wells located within 0.5 mile radius of Latitude 32°28'48" and Longitude 91°59'27"

Parish	Section	Owner Name	DOTD Well #	Owner Well #	Driller's Name	Well Depth (ft)	Well Use	Casing Size (in)	Drill Date	Water Level (ft)	W.L. Date Measured	Geologic Unit	Latitude	Longitude	Avail Info	Distar in Mil
Ouachita	007	MAGNOLIA LANDFI	- 561		HARGROVE (BEN)	500	PUBLIC SUPPLY	4X2.50	01/86	106	01/07/86	124SPRT	322848	915929	D W	0.0
Ouachita	007	WASTE MANAGE	- 5556Z	P-2	CCI	14	PLUGGED	1.25	07/93	6	08/05/93	112MRVAC	322849	915948	D W	0.3
Ouachita	007	WASTE MANAGE	- 5557Z	P-3	CCI	20	PLUGGED	1.25	07/93	10	08/05/93	112MRVAC	322841	915949	D W	0.3
Ouachita	007	WASTE MANAGE	- 5768Z	B-PZ-10	SINGLEY	24	PIEZOMETER	2	01/96	15	02/27/96	112MRVAC	322836	915926	D W	0.2
Ouachita	007	WASTE MANAGE	- 5769Z	B-PZ-11	SINGLEY	18	PLUGGED	2	01/96	16	02/27/96	112MRVAC	322826	915938	D W	0.4
Ouachita	007	WASTE MANAGE	- 5770Z	B-PZ-12	SINGLEY	84	PLUGGED	2	02/96	15	02/27/96	112MRVAC	322826	915937	D W	0.4
Ouachita	007	MAGNOLIA LANDFI	- 5800Z	PZ-17A	ANDERSON	37	PLUGGED	0.75	05/96	18	05/23/96	112MRVA	322827	915938	D W	0.4
Ouachita	007	MAGNOLIA LANDFI	- 5801Z	PZ-17B	ANDERSON	43	PLUGGED	0.75	05/96	17	05/23/96	112MRVA	322827	915938	D W	0.4
Ouachita	007	MAGNOLIA LANDFI	- 5802Z	PZ-17C	ANDERSON	54	PLUGGED	0.75	05/96	17	05/23/96	112MRVA	322904	915938	D W	0.3
Ouachita	007	MAGNOLIA LANDFI	- 5803Z	PZ-17D	ANDERSON	59	PLUGGED	0.75	05/96	17	05/23/96	112MRVA	322827	915938	D W	0.4
Ouachita	007	WASTE	-	MW-7	SOIL	40	PLUGGED	2	10/85			112MRVA	322825	915928		0.4

		MANAGE	5881Z		TESTING											
Ouachita	007	WASTE MANAGE	- 5885Z	MW-11	ANDERSON	33	MONITOR	2	04/97	14	04/08/97	112MRVA	322829	915927	D W	0.3
Ouachita	007	WASTE MANAGE	- 5886Z	MW-12	ANDERSON	31	MONITOR	2	04/97	13	04/08/97	112MRVA	322826	915932	D W	0.4
Ouachita	007	WASTE MANAGE	- 5887Z	MW-13	ANDERSON	33	MONITOR	2	04/97	12	04/08/97	112MRVA	322827	915941	D W	0.4
Ouachita	007	WASTE MANAGE	- 5890Z	MW-18	ANDERSON	49	MONITOR	2	04/97	18	04/08/97	112MRVA	322845	915927	D W	0.0
Ouachita	005	TIDWELL, R W	- 6157Z		BENNETT	60	IRRIGATION	4	09/99	30	09/03/99	112ORVA	322852	915921	D W	0.1

Available Information:
E - Geophysical Log
D - Driller's Log
M - Mechanical Analysis
Q - Quality of Water
P - Pumping Test
W - Water Level
B - Bacteriological Analysis

[Parish Codes] [Well Use Sub-Use Codes] [Explanation of Terms]

Select Wells

Registered Water Wells

Public Works & Water Resources Division
Water Resources Section

Wells located within 1 mile radius of Latitude 32°28'48" and Longitude 91°59'27"

Parish	Section	Owner Name	DOTD Well #	Owner Well #	Driller's Name	Well Depth (ft)	Well Use	Casing Size (in)	Drill Date	Water Level (ft)	W.L. Date Measured	Geologic Unit	Latitude	Longitude	Avail Info	DI In
Ouachita	005	E-Z MART	- 544	1	HARGROVE (BEN)	550	PLUGGED	4X2.50	06/83	109	06/15/83	124SPRT	322933	915923	D W	
Ouachita	007	MAGNOLIA LANDFI	- 561		HARGROVE (BEN)	500	PUBLIC SUPPLY	4X2.50	01/86	106	01/07/86	124SPRT	322848	915929	D W	
Ouachita	005	UAW LOCAL 1977	- 5034Z	UAW1	WILLIAMSON, R.	48	DOMESTIC	2	10/83	20	10/03/83	112MRVA	322939	915914	D W	
Ouachita	005	BFI	- 5094Z	DD-3	SOIL TESTING	45	PLUGGED	4	06/86			112MRVA	322920	915852	D	
Ouachita	005	BFI	- 5095Z	DD-4	SOIL TESTING	36	PLUGGED	4	06/86			112MRVA	322920	915901	D	
Ouachita	005	BFI	- 5096Z	DS-3	SOIL TESTING	25	PLUGGED	4	06/86			112MRVAC	322920	915852	D	
Ouachita	005	BFI	- 5097Z	DS-4	SOIL TESTING	20	PLUGGED	4	06/86			112MRVAC	322920	915901	D	
Ouachita	005	BFI	- 5098Z	DS-48	SOIL TESTING	19	PLUGGED	4	07/86			112MRVAC	322920	915901	D	
Ouachita	005	BFI	- 5099Z	DS-5	SOIL TESTING	28	MONITOR	4	06/86			112MRVAC	322926	915852	D	
Ouachita	005	BFI	- 5100Z	US-1	SOIL TESTING	22	PLUGGED	4	06/86			112MRVAC	322932	915903	D	

Ouachita	005	BFI	- 5101Z	UD-1	SOIL TESTING	41	PLUGGED	4	06/86			112MRVA	322932	915903	D
Ouachita	005	BFI	- 5348Z	G-8	SOIL TESTING	11	OTHER	0.75	08/90			112MRVAC	322932	915905	D
Ouachita	007	WASTE MANAGE	- 5555Z	P-1	CCI	19	PLUGGED	1.25	07/93	12	08/05/93	112MRVAC	322851	920003	D W
Ouachita	007	WASTE MANAGE	- 5556Z	P-2	CCI	14	PLUGGED	1.25	07/93	6	08/05/93	112MRVAC	322849	915948	D W
Ouachita	007	WASTE MANAGE	- 5557Z	P-3	CCI	20	PLUGGED	1.25	07/93	10	08/05/93	112MRVAC	322841	915949	D W
Ouachita	005	BFI	- 5583Z	G-3	SOIL TESTING	20	PLUGGED	4	.			112MRVAC	322918	915837	
Ouachita	005	BFI	- 5584Z	DD-5	SOIL TESTING	35	PLUGGED	4	.			112MRVAC	322923	915847	
Ouachita	005	BFI	- 5586Z	DD-2	MORETRENCH	33	PLUGGED	4	05/93	18	04/27/93	112MRVAC	322918	915837	D W
Ouachita	005	BFI	- 5587Z	DD-3R	MORETRENCH	37	PLUGGED	4	05/93	21	04/27/93	112MRVA	322919	915849	D W
Ouachita	005	BFI	- 5588Z	DD-4R	MORETRENCH	37	PLUGGED	4	05/93	21	05/27/93	112MRVA	322920	915859	D W
Ouachita	005	BFI	- 5590Z	DS-2	MORETRENCH	21	PLUGGED	4	05/93	16	05/27/93	112MRVAC	322918	915837	D W
Ouachita	005	BFI	- 5591Z	DS-3R	MORETRENCH	25	PLUGGED	4	05/93	21	05/27/93	112MRVAC	322919	915848	D W
Ouachita	007	WASTE MANAGE	- 5768Z	B-PZ-10	SINGLEY	24	PIEZOMETER	2	01/96	15	02/27/96	112MRVAC	322836	915926	D W
Ouachita	007	WASTE MANAGE	- 5769Z	B-PZ-11	SINGLEY	18	PLUGGED	2	01/96	16	02/27/96	112MRVAC	322826	915938	D W
Ouachita	007	WASTE MANAGE	- 5770Z	B-PZ-12	SINGLEY	84	PLUGGED	2	02/96	15	02/27/96	112MRVAC	322826	915937	D W
Ouachita	007	WASTE MANAGE	- 5771Z	B-PZ-14	SINGLEY	26	PIEZOMETER	2	02/96	11	02/27/96	112MRVAC	322827	915958	D W
Ouachita	007	WASTE MANAGE	- 5772Z	B-PZ-15	SINGLEY	20	PIEZOMETER	2	02/96	14	02/27/96	112MRVAC	322828	920009	D W
Ouachita	007	WASTE MANAGE	- 5773Z	B-PZ-16	SINGLEY	28	PIEZOMETER	2	02/96	13	02/27/96	112MRVAC	322843	920015	D W

Ouachita	007	MAGNOLIA LANDFI	- 5800Z	PZ-17A	ANDERSON	37	PLUGGED	0.75	05/96	18	05/23/96	112MRVA	322827	915938	D W
Ouachita	007	MAGNOLIA LANDFI	- 5801Z	PZ-17B	ANDERSON	43	PLUGGED	0.75	05/96	17	05/23/96	112MRVA	322827	915938	D W
Ouachita	007	MAGNOLIA LANDFI	- 5802Z	PZ-17C	ANDERSON	54	PLUGGED	0.75	05/96	17	05/23/96	112MRVA	322904	915938	D W
Ouachita	007	MAGNOLIA LANDFI	- 5803Z	PZ-17D	ANDERSON	59	PLUGGED	0.75	05/96	17	05/23/96	112MRVA	322827	915938	D W
Ouachita	007	MAGNOLIA LANDFI	- 5804Z	PZ-18A	ANDERSON	20	PLUGGED	0.75	05/96	10	05/23/96	112MRVAC	322833	920009	D W
Ouachita	007	MAGNOLIA LANDFI	- 5805Z	PZ-18B	ANDERSON	36	PLUGGED	0.75	05/96	10	05/23/96	112MRVA	322833	920009	D W
Ouachita	007	MAGNOLIA LANDFI	- 5806Z	PZ-18C	ANDERSON	53	PLUGGED	0.75	05/96	9	05/23/96	112MRVA	322833	920009	D W
Ouachita	007	MAGNOLIA LANDFI	- 5807Z	PZ-18D	ANDERSON	65	PLUGGED	0.75	05/96	10	05/23/96	112MRVA	322833	920009	D W
Ouachita	007	WASTE MANAGE	- 5877Z	MW-3	SOIL TESTING	40	PLUGGED	2	10/85			112MRVA	322824	920011	
Ouachita	007	WASTE MANAGE	- 5878Z	MW-4	SOIL TESTING	45	PLUGGED	2	10/85			112MRVA	322824	920001	
Ouachita	007	WASTE MANAGE	- 5879Z	MW-5	SOIL TESTING	53	PLUGGED	2	10/85			112MRVA	322824	915950	
Ouachita	007	WASTE MANAGE	- 5880Z	MW-6	SOIL TESTING	35	PLUGGED	2	10/85			112MRVA	322823	915940	
Ouachita	007	WASTE MANAGE	- 5881Z	MW-7	SOIL TESTING	40	PLUGGED	2	10/85			112MRVA	322825	915928	
Ouachita	007	WASTE MANAGE	- 5885Z	MW-11	ANDERSON	33	MONITOR	2	04/97	14	04/08/97	112MRVA	322829	915927	D W
Ouachita	007	WASTE MANAGE	- 5886Z	MW-12	ANDERSON	31	MONITOR	2	04/97	13	04/08/97	112MRVA	322826	915932	D W
Ouachita	007	WASTE MANAGE	- 5887Z	MW-13	ANDERSON	33	MONITOR	2	04/97	12	04/08/97	112MRVA	322827	915941	D W
Ouachita	007	WASTE MANAGE	- 5888Z	MW-14	ANDERSON	47	MONITOR	2	04/97	20	04/09/97	112MRVA	322828	915950	D W
Ouachita	007	WASTE MANAGE	- 5889Z	MW-16	ANDERSON	31	MONITOR	2	04/97	14	04/09/97	112MRVA	322828	920000	D W

Ouachita	007	WASTE MANAGE	- 5890Z	MW-18	ANDERSON	49	MONITOR	2	04/97	18	04/08/97	112MRVA	322845	915927	D W
Ouachita	006	DELPHI INTERIOR	- 5976Z	MW-1	WALKER-HILL (CO)	18	PLUGGED	2	05/98	6	05/12/98	112ORVAC	322931	915945	D W
Ouachita	006	DELPHI INTERIOR	- 5977Z	MW-2	WALKER-HILL (CO)	17	PLUGGED	2	04/98	4	05/12/98	112ORVAC	322932	915946	D W
Ouachita	006	DELPHI INTERIOR	- 5978Z	MW-3	WALKER-HILL (CO)	15	PLUGGED	2	04/98	12	05/12/98	112ORVAC	322931	915946	D W
Ouachita	006	DELPHI INTERIOR	- 5979Z	MW-4	WALKER-HILL (CO)	17	PLUGGED	2	04/98	8	05/12/98	112ORVAC	322928	915945	D W
Ouachita	006	DELPHI INTERIOR	- 5980Z	MW-5	WALKER-HILL (CO)	18	PLUGGED	2	04/98	7	05/13/98	112ORVAC	322928	915943	D W
Ouachita	006	DELPHI INTERIOR	- 5981Z	MW-6	WALKER-HILL (CO)	15	PLUGGED	2	05/98	7	05/13/98	112ORVAC	322933	915937	D W
Ouachita	006	DELPHI INTERIOR	- 5982Z	MW-7	WALKER-HILL (CO)	16	PLUGGED	2	05/98	11	05/12/98	112ORVAC	322935	915939	D W
Ouachita	006	DELPHI INTERIOR	- 5983Z	MW-8	WALKER-HILL (CO)	16	PLUGGED	2	05/98	15	05/12/98	112ORVAC	322933	915939	D W
Ouachita	006	DELPHI INTERIOR	- 5984Z	MW-9	WALKER-HILL (CO)	16	PLUGGED	2	05/98	12	05/13/98	112ORVAC	322928	915939	D W
Ouachita	006	DELPHI INTERIOR	- 5986Z	MW-11	WALKER-HILL (CO)	16	PLUGGED	2	05/98	7	05/12/98	112ORVAC	322932	915948	D W
Ouachita	006	DELPHI INTERIOR	- 5989Z	MW-14	WALKER-HILL (CO)	16	PLUGGED	2	05/98	5	05/13/98	112ORVAC	322938	915940	D W
Ouachita	005	HOIST & CRANE	- 6090Z		BENNETT	60	IRRIGATION	4	05/99	22	05/20/99	112ORVA	322937	915933	D W
Ouachita	006	DELPHI INTERIOR	- 6125Z	MW-15	WALKER-HILL (JA)	18	PLUGGED	2	07/99	9.93	07/28/99	112ORVAC	322939	915936	D W
Ouachita	006	DELPHI INTERIOR	- 6126Z	MW-16	WALKER-HILL (JA)	20	PLUGGED	2	07/99	3.7	07/27/99	112ORVAC	322931	915936	D W
Ouachita	006	DELPHI INTERIOR	- 6127Z	MW-17	WALKER-HILL (JA)	20	PLUGGED	2	07/99	15.3	07/28/99	112ORVAC	322927	915934	D W
Ouachita	006	DELPHI INTERIOR	- 6128Z	MW-18	WALKER-HILL (JA)	20	PLUGGED	2	07/99	19.28	07/28/99	112ORVAC	322924	915938	D W
Ouachita	006	DELPHI INTERIOR	- 6129Z	MW-19	WALKER-HILL (JA)	20	PLUGGED	2	07/99	10.59	07/28/99	112ORVAC	322924	915943	D W

Ouachita	006	DELPHI INTERIOR	- 6130Z	MW-20	WALKER-HILL (JA)	20	PLUGGED	2	07/99	10.09	07/28/99	112ORVAC	322925	915948	D W
Ouachita	005	TIDWELL, R W	- 6157Z		BENNETT	60	IRRIGATION	4	09/99	30	09/03/99	112ORVA	322852	915921	D W
Ouachita	005	E Z MART	- 6204Z		UNKNOWN	60	PLUGGED	4	.			112ORVA	322935	915921	
Ouachita	061	CWI WHITE OAKS	- 6420Z	MW-3	SOIL TESTING	52	MONITOR	4	06/03	18	06/05/03	00000000	322924	915844	D W
Ouachita	061	CWI WHITE OAKS	- 6421Z	MW-4	SOIL TESTING	57	MONITOR	4	06/03	30	06/04/03	00000000	322918	915843	D W
Ouachita	061	CWI WHITE OAKS	- 6422Z	MW-5	SOIL TESTING	60	MONITOR	4	06/03	14	06/04/03	00000000	322917	915836	D W

Available Information:
E - Geophysical Log
D - Driller's Log
M - Mechanical Analysis
Q - Quality of Water
P - Pumping Test
W - Water Level
B - Bacteriological Analysis

[Parish Codes] [Well Use Sub-Use Codes] [Explanation of Terms]

Select Wells

Registered Water Wells

Public Works & Water Resources Division
Water Resources Section

Wells located within 0.5 mile radius of Latitude 32°28'48" and Longitude 91°59'27"

Parish	Section	Owner Name	DOTD Well #	Owner Well #	Driller's Name	Well Depth (ft)	Well Use	Casing Size (in)	Drill Date	Water Level (ft)	W.L. Date Measured	Geologic Unit	Latitude	Longitude	Avail Info	Distar in Mil
Ouachita	007	MAGNOLIA LANDFI	- 561		HARGROVE (BEN)	500	PUBLIC SUPPLY	4X2.50	01/86	106	01/07/86	124SPRT	322848	915929	D W	0.0
Ouachita	007	WASTE MANAGE	- 5556Z	P-2	CCI	14	PLUGGED	1.25	07/93	6	08/05/93	112MRVAC	322849	915948	D W	0.3
Ouachita	007	WASTE MANAGE	- 5557Z	P-3	CCI	20	PLUGGED	1.25	07/93	10	08/05/93	112MRVAC	322841	915949	D W	0.3
Ouachita	007	WASTE MANAGE	- 5768Z	B-PZ-10	SINGLEY	24	PIEZOMETER	2	01/96	15	02/27/96	112MRVAC	322836	915926	D W	0.2
Ouachita	007	WASTE MANAGE	- 5769Z	B-PZ-11	SINGLEY	18	PLUGGED	2	01/96	16	02/27/96	112MRVAC	322826	915938	D W	0.4
Ouachita	007	WASTE MANAGE	- 5770Z	B-PZ-12	SINGLEY	84	PLUGGED	2	02/96	15	02/27/96	112MRVAC	322826	915937	D W	0.4
Ouachita	007	MAGNOLIA LANDFI	- 5800Z	PZ-17A	ANDERSON	37	PLUGGED	0.75	05/96	18	05/23/96	112MRVA	322827	915938	D W	0.4
Ouachita	007	MAGNOLIA LANDFI	- 5801Z	PZ-17B	ANDERSON	43	PLUGGED	0.75	05/96	17	05/23/96	112MRVA	322827	915938	D W	0.4
Ouachita	007	MAGNOLIA LANDFI	- 5802Z	PZ-17C	ANDERSON	54	PLUGGED	0.75	05/96	17	05/23/96	112MRVA	322904	915938	D W	0.3
Ouachita	007	MAGNOLIA LANDFI	- 5803Z	PZ-17D	ANDERSON	59	PLUGGED	0.75	05/96	17	05/23/96	112MRVA	322827	915938	D W	0.4
Ouachita	007	WASTE	-	MW-7	SOIL	40	PLUGGED	2	10/85			112MRVA	322825	915928		0.4

		MANAGE	5881Z		TESTING											
Ouachita	007	WASTE MANAGE	- 5885Z	MW-11	ANDERSON	33	MONITOR	2	04/97	14	04/08/97	112MRVA	322829	915927	D W	0.3
Ouachita	007	WASTE MANAGE	- 5886Z	MW-12	ANDERSON	31	MONITOR	2	04/97	13	04/08/97	112MRVA	322826	915932	D W	0.4
Ouachita	007	WASTE MANAGE	- 5887Z	MW-13	ANDERSON	33	MONITOR	2	04/97	12	04/08/97	112MRVA	322827	915941	D W	0.4
Ouachita	007	WASTE MANAGE	- 5890Z	MW-18	ANDERSON	49	MONITOR	2	04/97	18	04/08/97	112MRVA	322845	915927	D W	0.0
Ouachita	005	TIDWELL, R W	- 6157Z		BENNETT	60	IRRIGATION	4	09/99	30	09/03/99	112ORVA	322852	915921	D W	0.1

Available Information:
E - Geophysical Log
D - Driller's Log
M - Mechanical Analysis
Q - Quality of Water
P - Pumping Test
W - Water Level
B - Bacteriological Analysis

[Parish Codes] [Well Use Sub-Use Codes] [Explanation of Terms]

LDNR Office Of Conservation
Wells By Lambert Coordinates

Lat. 32°28'48" Long 91°59'27"

Lambert-X: 3437848 **Lambert-Y:** 720631

North Y: **East X:** **South Y:** **West X:**

Datum Standard 1983 Lambert Coordinates

Zone N

Radius(Ft): 2000

Submit Query

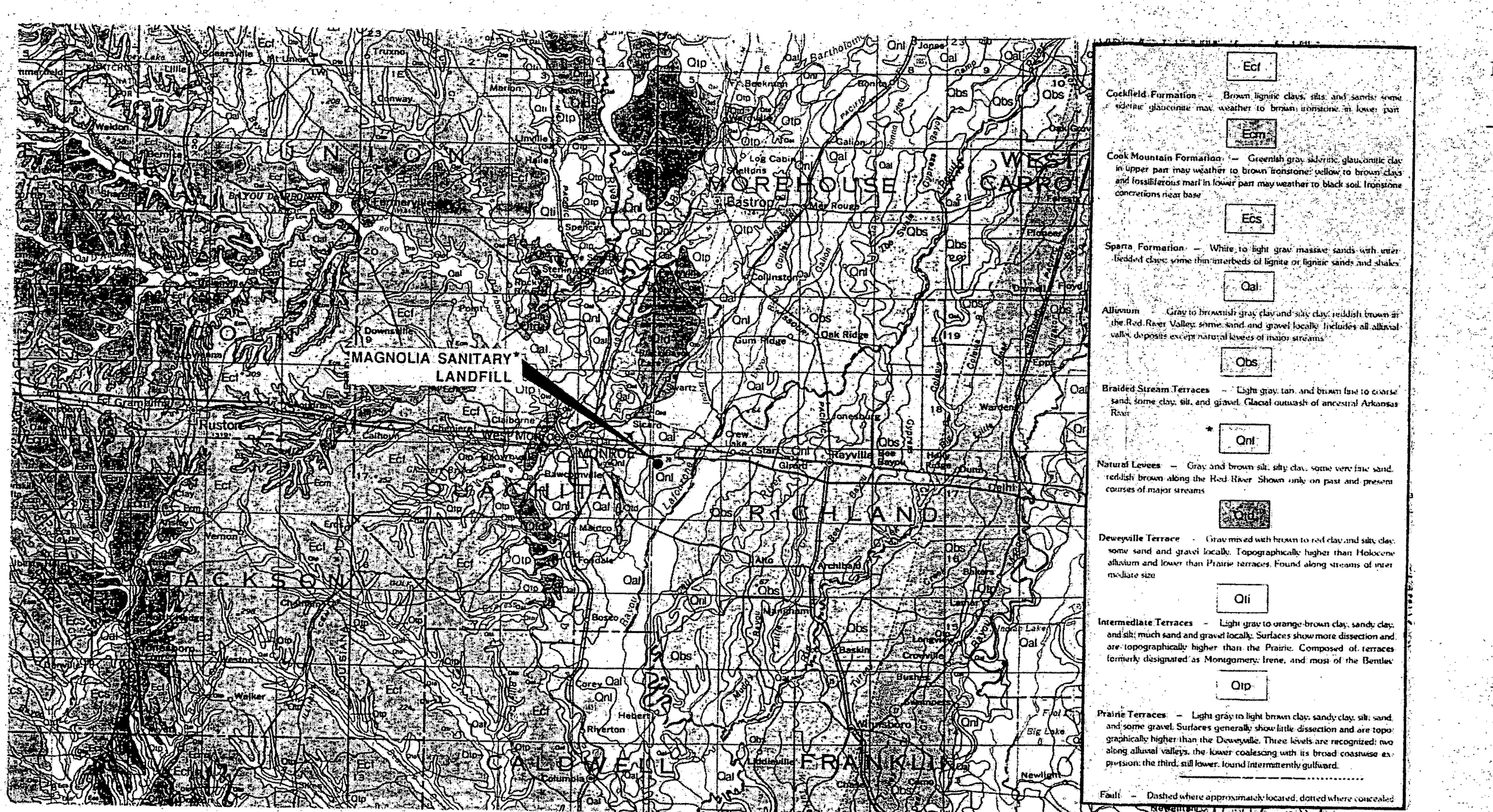
Wells by Lambert Coordinates

No Data Found

FAULT LOCATION MAP
(LAC 33:VII.521.A.2.B AND 709.A.5)

EXHIBIT A.10

BEST COPY



0 miles 8
Scale

...e: Geologic Map of Louisiana (1984).

Project No.	66415.300				
Drawing No.	66415-F				
Drawn By:	MCNAMARA				
Checked By:	RICHARDSON	DATE	NO.	REVISION	BY

Waste Management of Louisiana, Inc.
Monroe, Louisiana
CLIENT

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

RUST ENVIRONMENT & INFRASTRUCTURE

FAULT LOCATION MAP

A.10
EXHIBIT

PLANNING AND URBAN DEVELOPMENT
LETTER REGARDING AIRPORT LOCATION
(LAC 33:VII.709.A.2)

EXHIBIT A.11

PLANNING AND URBAN DEVELOPMENT DEPARTMENT

P. O. Box 123
Monroe, Louisiana 71210-0123

Director's Office
Division

May 11, 1994

Mr. Edwin W. Hamala
General Manager
Waste Management of Central Louisiana, Inc.
5607 Monroe Highway
Pineville, Louisiana 71360

Dear Mr. Hamala:

This letter comes in response to the request for an Environmental Assessment of Waste Management, Inc., located outside of the City of Monroe, southeasterly direction of I-20. It is the impression of this office that the enviromental affect will be insignificant on the City of Monroe; for we find that the site nearest point to our Airport is in excess of 12,000 feet, and an excess of 8,000 feet from our nearest city limits line.

The City of Monroe, however, is preceding with the development of 985,000 square feet Mall along the Milhaven corridor and expects future growth will eventually shorten the distance of our city limit line to the site.

If I or this office can be of assistance to you; please do not hesitate to let us know.

Very truly yours,

Kenneth J. Newman
Director of PUD

KJN:GLH

cc: Terry Denmon & Assoc. ✓
Planning & Zoning

FAA FORM 7460-1 REGARDING NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION SUBMITTED TO THE FAA
(LAC 33:VII.709.A.2)

SIGMA ENGINEERS & CONSTRUCTORS, INC.
A SIGMA COMPANY IN ASSOCIATION WITH SIGMA CONSULTING GROUP, INC.

INDUSTRIAL, ENVIRONMENTAL, STRUCTURAL, MECHANICAL, PROCESS, ELECTRICAL, INSTRUMENTATION

Stephen J. Brasuell, P.E.
President

Michael N. Dooley, M.B.A., P.E.
Vice-President

Paul R. Schneider
Vice-President

Daniel B. Kais, P.E.
Vice-President

June 8, 2005

Express Processing Center
Federal Aviation Administration
Southwest Regional Office
Air Traffic Airspace Branch, ASW-520
2601 Meacham Blvd.
Fort Worth, TX 76137-4298

RE: Magnolia Sanitary Landfill
Monroe, Ouachita Parish

Sigma Engineers & Constructors, Inc., on behalf of Waste Management of Louisiana, LLC, hereby submits an updated Form 7460-1 (2-99), Notice of Proposed Construction or Alteration. This submittal is made pursuant to the Magnolia Sanitary Landfill renewal application for a solid waste permit. No design changes are being made at this time; the application is solely for renewal of the current solid waste permit. A copy of the previously submitted Notice of Proposed Construction or Alteration dated September 9, 1993 is attached. The facility is located off of Louisiana Highway 594 approximately one half mile south of Interstate 20. A site location map is attached.

Thank you in advance for your expedient handling of our request. Should you have any questions please contact me at (225) 298-0111, Extension 156.

Very truly yours,
SIGMA ENGINEERS & CONSTRUCTORS, INC.

Susan Douglas

Susan Douglas

Attachment
c: M. Noel
50504 File

10305 Airline Highway • Baton Rouge, Louisiana 70816 • Phone (225) 298-0800 • Fax (225) 298-0255
E-mail: sigmacg@sigmacg.com • Web Page: www.sigmacg.com

Please Type or Print on This Form

Form Approved OMB No. 2120-0001

U.S. Department of Transportation
Federal Aviation Administration

Failure To Provide All Requested Information May Delay Processing of Your Notice

Notice of Proposed Construction or Alteration

FOR FAA USE ONLY
Aeronautical Study Number
- - -

1. Sponsor *(person, company, etc. proposing this action)*:
Attn. of: Gabe Landry
Name: Waste Management of Louisiana, LLC
Address: Magnolia Sanitary Landfill
1000 Russell Sage Road
City: Monroe State: LA Zip: 71203
Telephone: (318) 343-5636 Fax: (318) 345-3721

2. Sponsor's Representative *(if other than #1)*:
Attn. of: Mark Noel
Name: Waste Management
Address: 1450 Country Club Road
City: Jackson State: MS Zip: 39209
Telephone: (601) 923-5115 Fax: (601) 923-5134

3. Notice of: ☐ New Construction ☐ Alteration ☒ Existing

4. Duration: ☒ Permanent ☐ Temporary (months, days)

5. Work Schedule: Beginning 2/1996 End 2016

6. Type: ☐ Antenna Tower ☐ Crane ☐ Building ☐ Power Line ☒ Landfill ☐ Water Tank ☐ Other

7. Marking/Painting and/or Lighting Preferred:
☐ Red Lights and Paint ☐ Dual - Red and Medium Intensity White
☐ White - Medium Intensity ☐ Dual - Red and High Intensity White
☐ White - High Intensity ☒ Other N/A

8. FCC Antenna Structure Registration Number *(if applicable)*:
N / A

9. Latitude: 32.00 ° 28.00 ' 48.00 . "

10. Longitude: 91.00 ° 59.00 ' 27.00 . "

11. Datum: ☒ NAD 83 ☐ NAD 27 ☐ Other

12. Nearest: City: Monroe State: LA

13. Nearest Public-use (not private-use) or Military Airport or Heliport:
Monroe Regional Airport

14. Distance from #13. to Structure: 13,000

15. Direction from #13. to Structure: Southeast

16. Site Elevation *(AMSL)*: 200.00 ft.

17. Total Structure Height *(AGL)*: 200.00 ft.

18. Overall height (#16. + #17.) *(AMSL)*: 200.00 ft.

19. Previous FAA Aeronautical Study Number (if applicable):
N / A - OE

20. Description of Location: (Attach a USGS 7.5 minute Quadrangle Map with the precise site marked and any certified survey.)

Magnolia Sanitary Landfill is located approximately 0.5 miles south of the intersection of Interstate 20 and Louisiana Highway 594, or approximately 1.5 miles southeast of Monroe, Louisiana.

21. Complete Description of Proposal:

This Form 7460-1 is being submitted as part of the application process to renew the solid waste permit for the Magnolia Sanitary Landfill. No design changes are being permitted at this time, and the previously submitted final elevations and footprint are unchanged. The peak of the landfill will be greater than 13,000 feet from the nearest airport runway as shown on the attached figure.

A Form 7460-1 was filed on 9/9/93 for the current confirguration of the landfill (see copy attached). Contact with the Monroe Regional Airport confirmed that no runways have been constructed since 1993.

Frequency/Power (kW)	

Notice is required by 14 Code of Federal Regulations, part 77 pursuant to 49 U.S.C., Section 44718. Persons who knowingly and willingly violate the notice requirements of part 77 are subject to a civil penalty of $1,000 per day until the notice is received, pursuant to 49 U.S.C., section 46301 (a).

I hereby certify that all of the above statements made by me are true, complete, and correct to the best of my knowledge. In addition, I agree to mark and/or light the structure in accordance with established marking and lighting standards as necessary.

Date	Typed or Printed name and Title of Person Filing Notice	Signature
6/3/2005	Mark Noel	

Magnolia Sanitary Landfill
P. O. Box 13467
1000 Russell Sage Road
Monroe, Louisiana 71213
Phone (318) 343-5636

A Waste Management Company

September 9, 1993

Mr. Ed Chambers
U.S. Department of Transportation
Federal Aviation Administration
Southwest Regional Office
Air Traffic Division ASW 630 H
4400 Blue Mound Road
Fort Worth, Texas 76193-0630

Dear Mr. Chambers:

Attached please find Federal Aviation Administration (FAA) Notification Form 7460-1 for Notice of Proposed Construction or Alteration. This form is being submitted to inform your office of the proposed vertical extension to Magnolia Sanitary Landfill in Monroe, Louisiana. This is an existing facility which is currently permitted as a non-hazardous municipal and industrial waste disposal facility under the Louisiana Solid Waste Rules and Regulations. As part of a permit modification for the facility, we are proposing to raise the final contours of the landfill to a maximum height of 200 feet mean sea level (msl). This elevation is approximately 138 feet above the natural ground surface elevation of 62 feet msl.

Magnolia Sanitary Landfill is located approximately 13,000 feet from the nearest airport runway of Monroe Municipal Airport, as shown on the attached Site Vicinity Map. In accordance with 77.13(a)(2)(i), a 100 to 1 slope over this distance would create an imaginary surface 130 feet above ground level, or at elevation 193 feet msl, at the landfill site. The proposed final elevation of 200 feet msl for the landfill is only 8 feet above this level.

Please review this notification and contact Mr. Bill Hay at (318) 343-5636 or the undersigned at (601) 255-5553 if you have any questions concerning this information. We appreciate your expeditious response to this notification.

Very truly yours,
WASTE MANAGEMENT OF LOUISIANA, INC.

Roger Raines
Environmental Engineer

attachment

copy: Mr. Bill Hay
Ms. Terri Richardson

Printed on recycled paper.

DO NOT REMOVE CARBONS

Form Approved OMB No. 2120-0001

U.S. Department of Transportation
Federal Aviation Administration

NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION

Aeronautical Study Number

1. Nature of Proposal

A. Type	B. Class	C. Work Schedule Dates
☐ New Construction	☒ Permanent	Beginning Feb. 1996
☒ Alteration	☐ Temporary (Duration ______ months)	End ± 2016

3A. Name and address of individual, company, corporation, etc. proposing the construction or alteration. *(Number, Street, City, State and Zip Code)*

(318) 343-5636
area code Telephone Number

TO
Mr. Bill Hay
Waste Management of Louisiana, Inc.
Magnolia Sanitary Landfill
1000 Russell Sage Road
Monroe, LA 71203

B. Name, address and telephone number of proponent's representative if different than 3 above.

Mr. Roger Raines (601) 255-5553
Pecan Grove Landfill
9685 Firetower Road
Pass Christian, MS 39571

2. Complete Description of Structure

A. Include effective radiated power and assigned frequency of all existing, proposed or modified AM, FM, or TV broadcast stations utilizing this structure

B. Include size and configuration of power transmission lines and their supporting towers in the vicinity of FAA facilities and public airports

C. Include information showing site orientation, dimensions and construction materials of the proposed structure

A. None
B. None
C. See attached figures for site orientation and dimensions. The landfill will contain non-hazardous waste, properly covered.

(If more space is required, continue on a separate sheet.)

4. Location of Structure

A. Coordinates (To nearest second)	B. Nearest City, Town and State	C. Name of nearest airport, heliport, flightpark, or seaplane base
	Monroe, Louisiana	Monroe Municipal Airport
Latitude 32° 28' 49"	(1) Distance to 4B: 1.5 Miles	(1) Distance from structure to nearest point of nearest runway: 13,000 feet
Longitude [illegible]° 00' 08"	(2) Direction to 4B: Northwest	(2) Direction from structure to airport: Northwest

5. Height and Elevation *(Complete to the nearest foot)*

A. Elevation of site above mean sea level	62 Ft.
B. Height of Structure including all appurtenances and lighting (if any) above ground, or water if so situated	138 Ft.
C. Overall height above mean sea level (A + B)	200 Ft.

D. Description of location of site with respect to highways, streets, airports, prominent terrain features, existing structures, etc. Attach a U.S. Geological Survey quadrangle map or equivalent showing the relationship of construction site to nearest airport(s). *(If more space is required, continue on a separate sheet of paper and attach to this notice.)*

Magnolia Landfill is located near the intersection of Interstate 20 and LA. Hwy. 594 approximately 1.5 miles southeast of Monroe, Louisiana. The peak of the landfill will be greater than 13,000 feet from the nearest airport runway, as shown on the attached Figure.

Notice is required by Part 77 of the Federal Aviation Regulations (14 C.F.R. Part 77) pursuant to Section 1101 of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1101). *Persons who knowingly and willingly violate the Notice requirements of Part 77 are subject to a fine (criminal penalty) of not more than $500 for the first offense and not more than $2,000 for subsequent offenses, pursuant to Section 902(a) of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1472(a)).*

I HEREBY CERTIFY that all of the above statements made by me are true, complete, and correct to the best of my knowledge. In addition, I agree to obstruction mark and/or light the structure in accordance with established marking & lighting standards if necessary.

Date	Typed Name/Title of Person Filing Notice	Signature
08 SEPT 93	ROGER D. RAINES / ENVIRONMENTAL ENGINEER	[signature]

FOR FAA USE ONLY — FAA will either return this form or issue a separate acknowledgement.

The Proposal:
☐ Does not require a notice to FAA.
☐ Is not identified as an obstruction under any standard of FAR, Part 77, Subpart C, and would not be a hazard to air navigation.
☐ Is identified as an obstruction under the standards of FAR, Part 77, Subpart C, but would not be a hazard to air navigation.
☐ Should be obstruction ☐ marked ☐ lighted per FAA Advisory Circular 70/7460-1, Chapter(s)
☐ Obstruction marking and lighting are not necessary.

Supplemental Notice of Construction, FAA Form 7460-2 is required any time the project is abandoned, or
☐ At least 48 hours before the start of construction.
☐ Within five days after the construction reaches its greatest height.

This determination expires on ______ unless:
(a) extended, revised or terminated by the issuing office;
(b) the construction is subject to the licensing authority of the Federal Communications Commission and an application for a construction permit is made to the FCC on or before the above expiration date. In such case the determination expires on the date prescribed by the FCC for completion of construction, or on the date the FCC denies the application.

NOTE: Request for extension of the effective period of this determination must be postmarked or delivered to the issuing office at least 15 days prior to the expiration date.

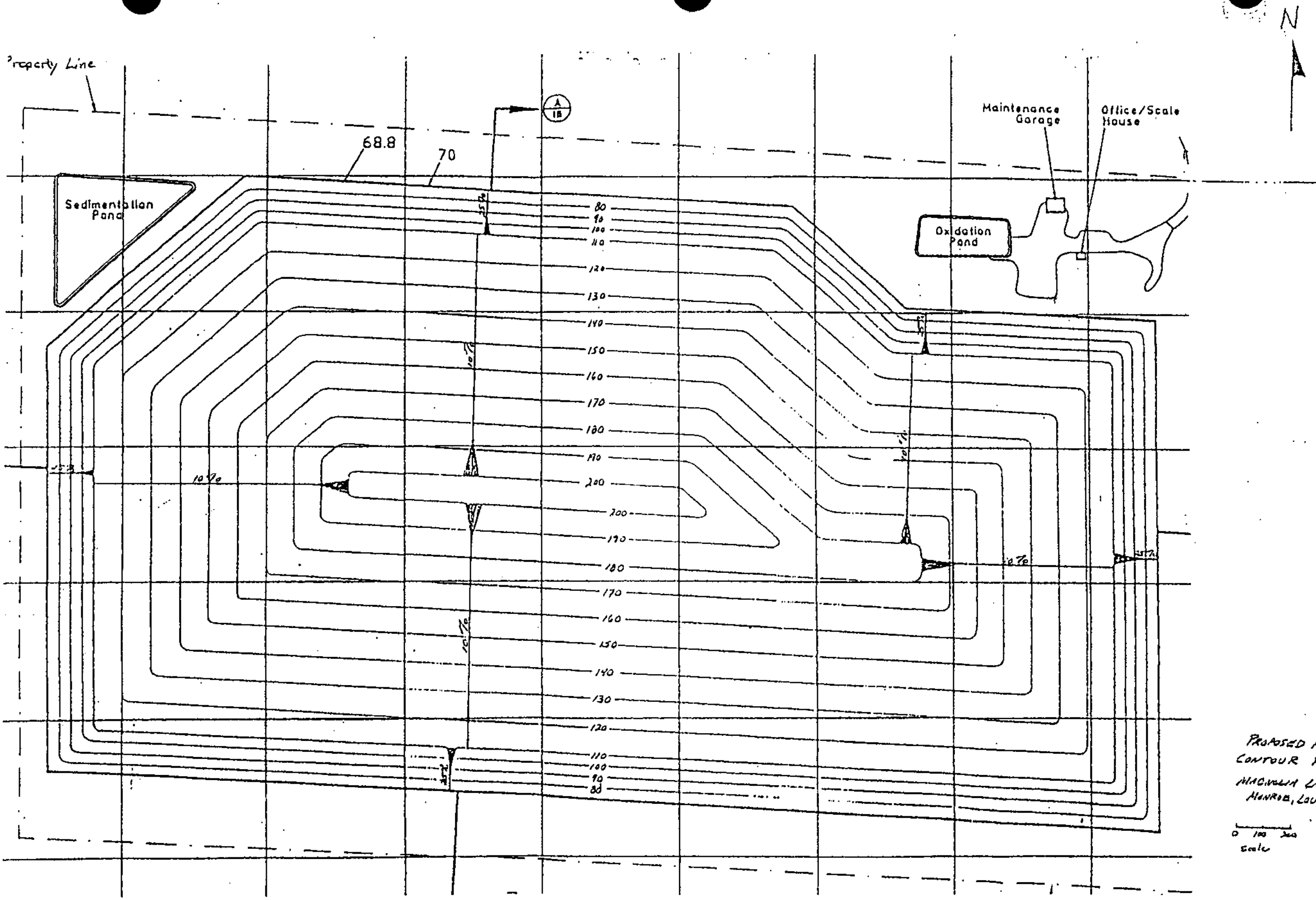
If the structure is subject to the licensing authority of the FCC, a copy of this determination will be sent to that Agency.

Remarks:

Issued in	Signature	Date

FAA Form 7460-1 (8-85)

DO NOT REMOVE CARBONS

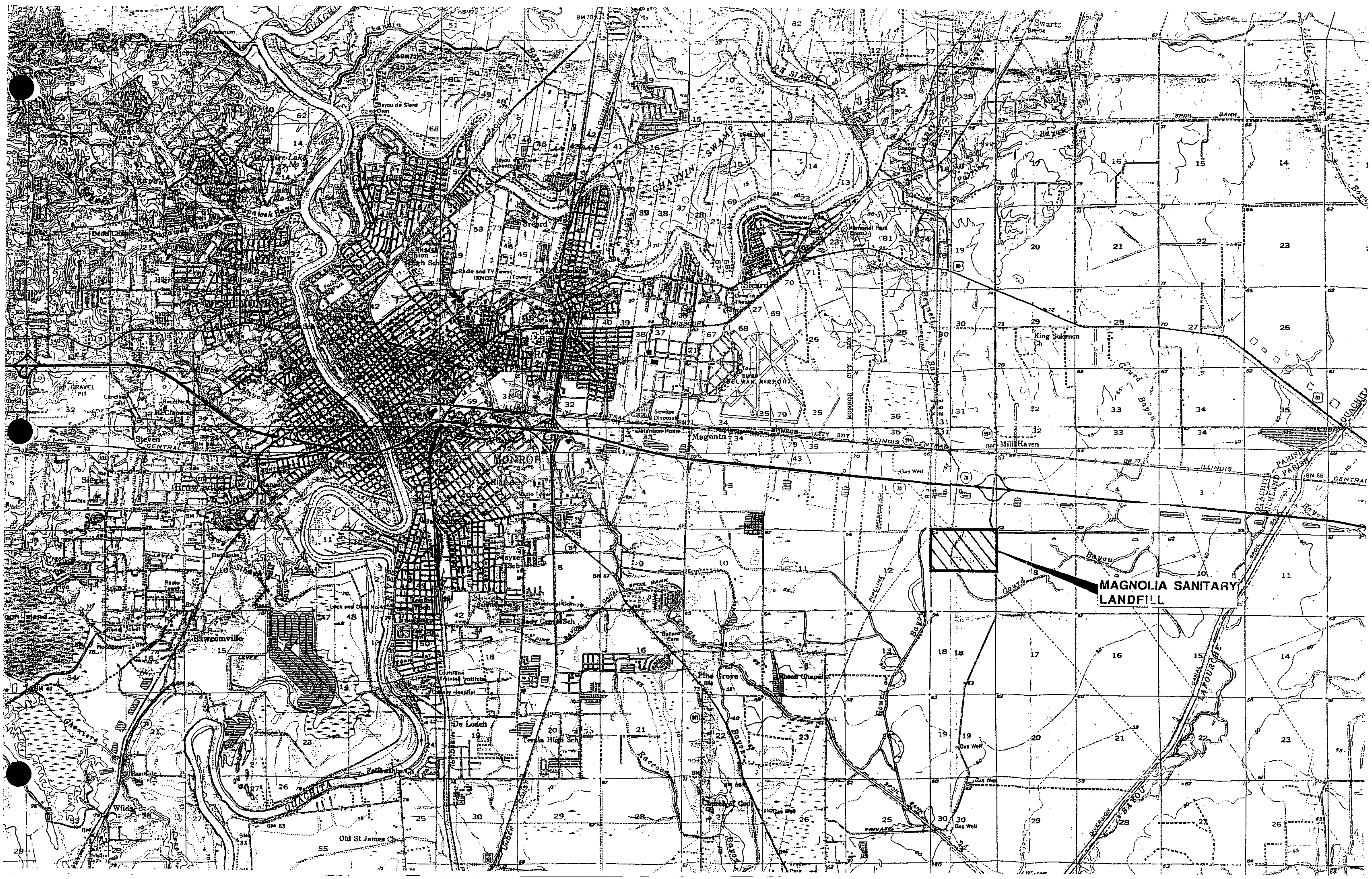


PROPOSED FINAL
CONTOUR PLAN
MAGNOLIA LANDFILL
MONROE, LOUISIANA

0 100 200
Scale

Proposed dimensions of landfill
peak (above elev. 190) are ≈ 1600 ft x 300 ft.

BEST COPY



MAGNOLIA SANITARY
LANDFILL
MONROE
Magenta
Mill Haven
King Solomon
Sicard
Pine Grove
De Loach
Old St James Ch
Brownsville
SELMAN AIRPORT
CHAUVIN SWAMP

FAA Form 7460-1 Regarding Notice of Proposed Construction or Alteration Submitted to the Monroe Municipal Airport (LAC 33:VII.709.A.2)

SIGMA
ENGINEERS &
CONSTRUCTORS, INC.
A SIGMA COMPANY IN ASSOCIATION WITH SIGMA CONSULTING GROUP, INC.

INDUSTRIAL, ENVIRONMENTAL, STRUCTURAL, MECHANICAL, PROCESS, ELECTRICAL, INSTRUMENTATION

Stephen J. Brasuell, P.E.
President

Paul R. Schneider
Vice-President

Michael N. Dooley, M.B.A., P.E.
Vice-President

Daniel B. Kais, P.E.
Vice-President

June 8, 2005

Mr. Cleve Norell
Monroe Municipal Airport
Southwest Regional Office
5400 Operations Road, Rm. 200
Monroe, Louisiana 71203

RE: Magnolia Sanitary Landfill
Monroe, Ouachita Parish

Sigma Engineers & Constructors, Inc., on behalf of Waste Management of Louisiana, LLC, hereby submits an updated Form 7460-1 (2-99), Notice of Proposed Construction or Alteration. This updated form and site location map are being concurrently submitted to the Federal Aviation Administration. This submittal is made pursuant to the Magnolia Sanitary Landfill renewal application for a solid waste permit. No design changes are being made at this time; the application is solely for renewal of the current solid waste permit. A copy of the previously submitted Notice of Proposed Construction or Alteration dated September 23, 1993 is attached. The facility is located off of Louisiana Highway 594 approximately one half mile south of Interstate 20. A site location map is attached.

Thank you in advance for your expedient handling of our request. Should you have any questions please contact me at (225) 298-0111, Extension 156.

Very truly yours,
SIGMA ENGINEERS & CONSTRUCTORS, INC.

Susan Douglas

Susan Douglas

Attachment
c: M. Noel
50504 File

Please Type or Print on This Form

Form Approved OMB No. 2120-0001

U.S. Department of Transportation
Federal Aviation Administration

Failure To Provide All Requested Information May Delay Processing of Your Notice

Notice of Proposed Construction or Alteration

FOR FAA USE ONLY
Aeronautical Study Number
- - -

1. Sponsor *(person, company, etc. proposing this action)* :
Attn. of: Gabe Landry
Name: Waste Manaagement of Louisiana, LLC
Address: Magnolia Sanitary Landfill
1000 Russell Sage Road
City: Monroe State: LA Zip: 71203
Telephone: (318) 343-5636 Fax: (318) 345-3721

2. Sponsor's Representative *(if other than #1)* :
Attn. of: Mark Noel
Name: Waste Management
Address: 1450 Country Club Road
City: Jackson State: MS Zip: 39209
Telephone: (601) 923-5115 Fax: (601) 923-5134

3. Notice of: ☐ New Construction ☐ Alteration ☒ Existing

4. Duration: ☒ Permanent ☐ Temporary (months, days)

5. Work Schedule: Beginning 2/1996 End 2016

6. Type: ☐ Antenna Tower ☐ Crane ☐ Building ☐ Power Line ☒ Landfill ☐ Water Tank ☐ Other

7. Marking/Painting and/or Lighting Preferred:
☐ Red Lights and Paint ☐ Dual - Red and Medium Intensity White
☐ White - Medium Intensity ☐ Dual - Red and High Intensity White
☐ White - High Intensity ☒ Other N/A

8. FCC Antenna Structure Registration Number *(if applicable)*:
N / A

9. Latitude: 32.00 ° 28.00 ' 48.00 . "

10. Longitude: 91.00 ° 59.00 ' 27.00 . "

11. Datum: ☒ NAD 83 ☐ NAD 27 ☐ Other

12. Nearest: City: Monroe State: LA

13. Nearest Public-use (not private-use) or Military Airport or Heliport:
Monroe Regional Airport

14. Distance from #13. to Structure: 13,000

15. Direction from #13. to Structure: Southeast

16. Site Elevation *(AMSL)*: 200.00 **ft.**

17. Total Structure Height *(AGL)*: 200.00 **ft.**

18. Overall height (#16. + #17.) *(AMSL)*: 200.00 **ft.**

19. Previous FAA Aeronautical Study Number (if applicable):
N / A - OE

20. Description of Location: (Attach a USGS 7.5 minute Quadrangle Map with the precise site marked and any certified survey.)

Magnolia Sanitary Landfill is located approximately 0.5 miles south of the intersection of Interstate 20 and Louisiana Highway 594, or approximately 1.5 miles southeast of Monroe, Louisiana.

21. Complete Description of Proposal:

This Form 7460-1 is being submitted as part of the application process to renew the solid waste permit for the Magnolia Sanitary Landfill. No design changes are being permitted at this time, and the previously submitted final elevations and footprint are unchanged. The peak of the landfill will be greater than 13,000 feet from the nearest airport runway as shown on the attached figure.

A Form 7460-1 was filed on 9/9/93 for the current confirguration of the landfill (see copy attached). Contact with the Monroe Regional Airport confirmed that no runways have been constructed since 1993.

Frequency/Power (kW)	

Notice is required by 14 Code of Federal Regulations, part 77 pursuant to 49 U.S.C., Section 44718. Persons who knowingly and willingly violate the notice requirements of part 77 are subject to a civil penalty of $1,000 per day until the notice is received, pursuant to 49 U.S.C., section 46301 (a).

I hereby certify that all of the above statements made by me are true, complete, and correct to the best of my knowledge. In addition, I agree to mark and/or light the structure in accordance with established marking and lighting standards as necessary.

Date	Typed or Printed name and Title of Person Filing Notice	Signature
6/3/2005	Mark Noel	

Magnolia Sanitary Landfill
P. O. Box 13467
1000 Russell Sage Road
Monroe, Louisiana 71213
Phone (318) 343-5636

A Waste Management Company

September 23, 1993

Mr. Cleve Norell
Monroe Municipal Airport
5400 Operations Road, Rm. 200
Monroe, Louisiana 71203

Dear Mr. Norell:

Attached please find Federal Aviation Administration (FAA) Notification Form 7460-1 for Notice of Proposed Construction or Alteration. This form is being submitted in accordance with the requirements of the Louisiana Administrative Code (LAC) 33:VII.709.A.2 to inform your office that Magnolia Sanitary Landfill is located within a five mile radius of Monroe Municipal Airport and a vertical and horizontal expansion of the landfill is planned. This is an existing facility which is currently permitted as a non-hazardous municipal and industrial waste disposal facility under the Louisiana Solid Waste Rules and Regulations. As part of a permit modification for the facility, we are proposing to raise the final contours of the landfill to a maximum height of 200 feet mean sea level (msl). This elevation is approximately 138 feet above the natural ground surface elevation of 62 feet msl.

Magnolia Sanitary Landfill is located approximately 13,000 feet from the nearest airport runway of Monroe Municipal Airport, as shown on the attached Site Vicinity Map. In accordance with Federal Aviation Regulations 77.13(a)(2)(i), a 100 to 1 slope over this distance would create an imaginary surface 130 feet above ground level, or at elevation 192 feet msl, at the landfill site. The proposed final elevation of 200 feet msl for the landfill is only 8 feet above this level.

Please review this notification and contact Mr. Bill Hay at (318) 343-5636 or Mr. Roger Raines at (601) 255-5553 if you have any questions concerning this information. We appreciate your expeditious response to this notification.

Very truly yours,

Waste Management of Louisiana, Inc.

Roger Raines, P.E.
Environmental Engineer

att.

cc: Mr. Bill Hay, Manager
Magnolia Sanitary Landfill

Printed on recycled paper.

BEST COPY

DO NOT REMOVE CARBONS

Form Approved OMB No. 2120-0001

US Department of Transportation
Federal Aviation Administration

NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION

Aeronautical Study Number

1. Nature of Proposal

A. Type	B. Class	C. Work Schedule Dates
☒ New Construction	☒ Permanent	Beginning Feb. 1996
☐ Alteration	☐ Temporary (Duration ______ months)	End ± 2016

3A. Name and address of individual, company, corporation, etc. proposing the construction or alteration. *(Number, Street, City, State and Zip Code)*

(318) 343-5636
area code Telephone Number

TO

Mr. Bill Hay
Waste Management of Louisiana, Inc.
Magnolia Sanitary Landfill
1000 Russell Sage Road
Monroe, LA 71203

B. Name, address and telephone number of proponent's representative if different than 3 above.

Mr. Roger Raines (601) 255-5553
Pecan Grove Landfill
9685 Firetower Road
Pass Christian, MS 39571

2. Complete Description of Structure

A. Include effective radiated power and assigned frequency of all existing, proposed or modified AM, FM, or TV broadcast stations utilizing this structure.

B. Include size and configuration of power transmission lines and their supporting towers in the vicinity of FAA facilities and public airports.

C. Include information showing site orientation, dimensions, and construction materials of the proposed structure

A. None
B. None
C. See attached figures for site orientation and dimensions. The landfill will contain non-hazardous waste, properly covered.

(If more space is required, continue on a separate sheet.)

4. Location of Structure

A. Coordinates (To nearest second)	B. Nearest City, Town and State	C. Name of nearest airport, heliport, flightpark, or seaplane base
	Monroe, Louisiana	Monroe Municipal Airport
Latitude 32° 28' 49"	(1) Distance to 4B: 1.5 Miles	(1) Distance from structure to nearest point of nearest runway: 13,000 feet
Longitude 92° 00' 08"	(2) Direction to 4B: Northwest	(2) Direction from structure to airport: Northwest

5. Height and Elevation *(Complete to the nearest foot)*

A. Elevation of site above mean sea level	62 Ft.
B. Height of Structure including all appurtenances and lighting *(if any)* above ground, or water if so situated	138Ft.
C. Overall height above mean sea level (A + B)	200 Ft.

D. Description of location of site with respect to highways, streets, airports, prominent terrain features, existing structures, etc. Attach a U.S. Geological Survey quadrangle map or equivalent showing the relationship of construction site to nearest airport(s). *(If more space is required, continue on a separate sheet of paper and attach to this notice.)*

Magnolia Landfill is located near the intersection of Interstate 20 and LA. Hwy. 594 approximately 1.5 miles southeast of Monroe, Louisiana. The peak of the landfill will be greater than 13,000 feet from the nearest airport runway, as shown on the attached Figure.

Notice is required by Part 77 of the Federal Aviation Regulations (14 C.F.R. Part 77) pursuant to Section 1101 of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1101). Persons who knowingly and willingly violate the Notice requirements of Part 77 are subject to a fine (criminal penalty) of not more than $500 for the first offense and not more than $2,000 for subsequent offenses, pursuant to Section 902(a) of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1472(a)).

I HEREBY CERTIFY that all of the above statements made by me are true, complete, and correct to the best of my knowledge. In addition, I agree to obstruction mark and/or light the structure in accordance with established marking & lighting standards if necessary.

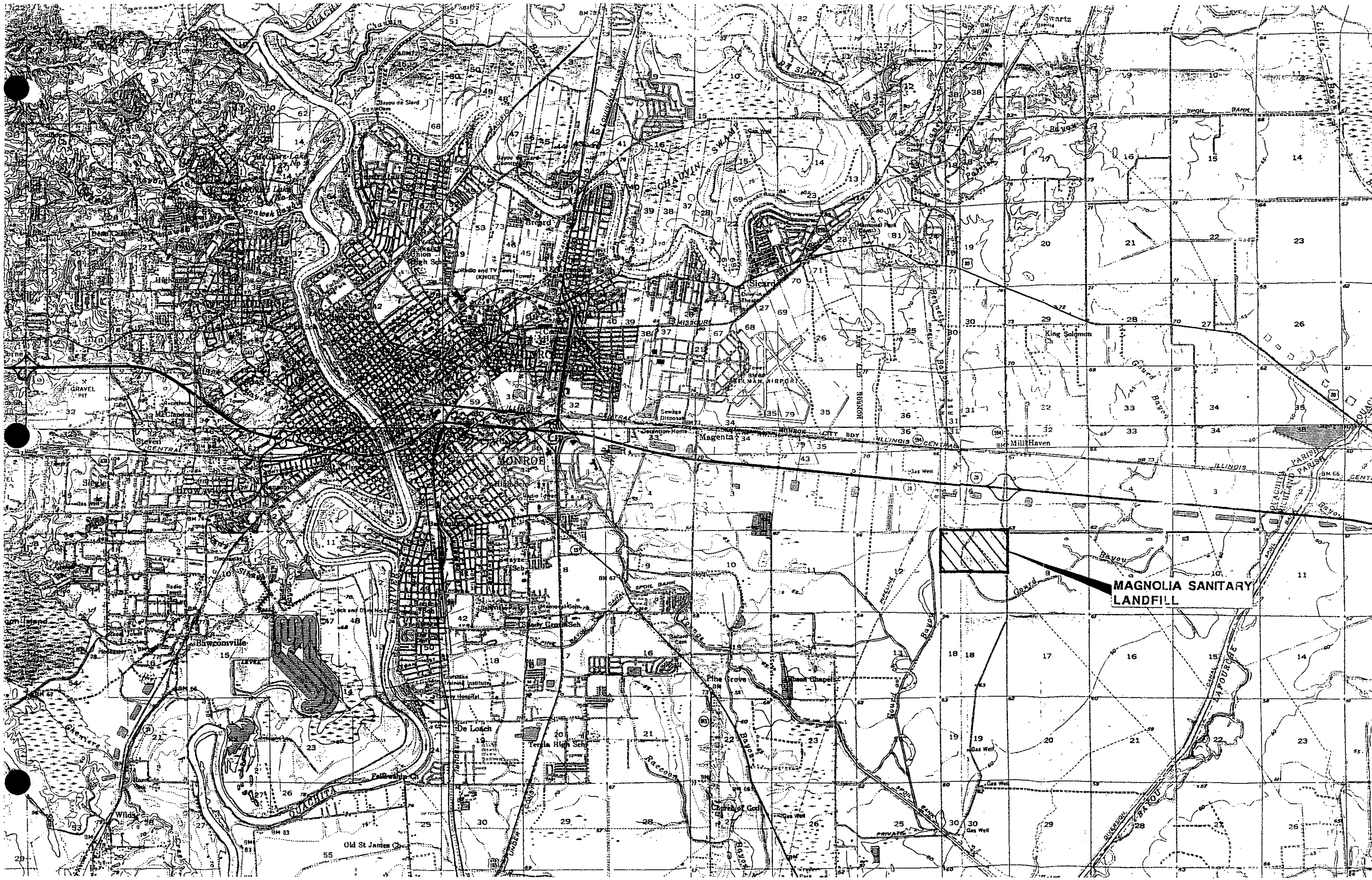
Date	Typed Name/Title of Person Filing Notice	Signature
9/23/93	ROGER RAINES, ENVIRONMENTAL ENGINEER	

FOR FAA USE ONLY

FAA Form 7460-1 (8-85)

DO NOT REMOVE CARBONS

BEST COPY



MAGNOLIA SANITARY LANDFILL
MONROE
Swartz
Sicard
King Solomon Ch
Magenta
Mill Haven
Pine Grove
De Loach
Old St James Ch

OPPJ LETTER REGARDING ZONING LAWS AND LAND USE (LAC 33:VII.709.A.6)

EXHIBIT A.14

Ouachita Parish Police Jury

P.O. Box 3007 • Monroe, Louisiana 71210-3007
(318) 327-1340 • FAX (318) 327-1339

District A
Paul Hargrove

District B
Mack Calhoun

District C
Walter M. Caldwell, IV

District D
Dorth Blade

District E
Kim Golden

District F
King Dawson

June 8, 2005

Susan Douglas
Sigma Engineers and Constructors, Inc.
10305 Airline Highway
Baton Rouge, Louisiana 70816

Re: Ouachita Parish Zoning Requirements

Dear Ms. Douglas:

The Ouachita Parish Police Jury has no zoning laws to control land use in Ouachita Parish outside of municipal boundaries.

Sincerely,

John Tom Murray

John Tom Murray
Director of Public Works

JTM/rd
Files: magnolia landfill zoning

EMERGENCY RESPONSE LETTERS
(R.S. 30:2157)

EXHIBIT A.15

Ouachita Parish Fire Department

Chief Patrick Hemphill

P.O. Box 4343 . Monroe, Louisiana 71211-4343
(318) 325-1621 . FAX (318) 322-7139

Paul Schneider
Sigma Environmental, Inc.
10305 Airline Highway
Baton Rouge, LA 70816

Greg Thompson
Chief of Fire Prevention
Ouachita Parish Fire Department

January 30, 2008

Dear Mr. Schneider,

Regarding your question on the response capabilities of our department in the event of a hazardous materials incident at Waste Management operations at the Magnolia Landfill in eastern Ouachita Parish:

First, allow me to point out a misstatement in LRS 30:2157 to "meet the requirements of Section 472 of the Life Safety Code of the National Fire Protection Association". NFPA 472 *Standard for Professional Competence of Responders to Hazardous Materials Incidents* is a standard unto itself, and not a part of NFPA 101 *Life Safety Code*. This misrepresentation is obviously an oversight by the drafters of the statute.

The Ouachita Parish Fire Department responds to all hazardous materials incidents within our jurisdiction in the role of a first responder, meeting the requirement of an awareness level response in NFPA 472. If the response requires operations or technicians level action, we are, under state law, required to notify the "authority having jurisdiction" – the Louisiana State Police. The situation would then be mitigated under their direction.

If further clarification is needed, please feel free to contact me at 318-325-1621.

Sincerely,

Greg Thompson

AMERICAN MEDICAL RESPONSE - MONROE

607 North Third Street – Monroe, La. 71201 – Office 318-322-8773 – Fax 318-324-4242

06 FEB 2008

SIGMA
Environmental, Inc.
10305 Airline Highway
Baton Rouge, La. 70816

RE: Magnolia Sanitary Landfill Solid Waste Permit (renewal)

This letter is to serve as attestation that American Medical Response of Monroe Louisiana fully agrees to provide Emergency Medical Services to Magnolia Sanitary Landfill in accordance with section 473 of the Life Safety Code of the National Fire Protection Association (NFPA).

Thank you,

Joel Plummer
Manager – Clinical Services, Communications and Safety Risk
AMR – Monroe, Louisiana
(318) 322-8773

ST. FRANCIS
MEDICAL CENTER
Franciscan Missionaries of
Our Lady Health System

February 29, 2008

Sigma Environmental, Inc.
Attn: Mr. Paul Schneider
10305 Airline Hwy
Baton Rouge, LA 70816

Re: **Magnolia Sanitary Landfill** **Sent via facsimile & US mail**
Monroe, LA

Dear Mr. Schneider,

In response to your letter dated Feruary 4, 2008, please allow this letter to serve as certification that St. Francis Medical Center, located at 309 Jackson Street, Monroe, LA does have the capability to accept and treat patients who are contaminated with hazardous materials.

St. Francis Medical Center is a full service acute-care medical center and maintains access to a database containing over 1.75 million up-to-date material safety data sheets. St. Francis Medical Center also has access to on-site decontamination capabilities through our regional emergency preparedness healthcare consortium.

Should you need further information, please contact me at (318)327-4878.

Sincerely,

Corby T. Reeves

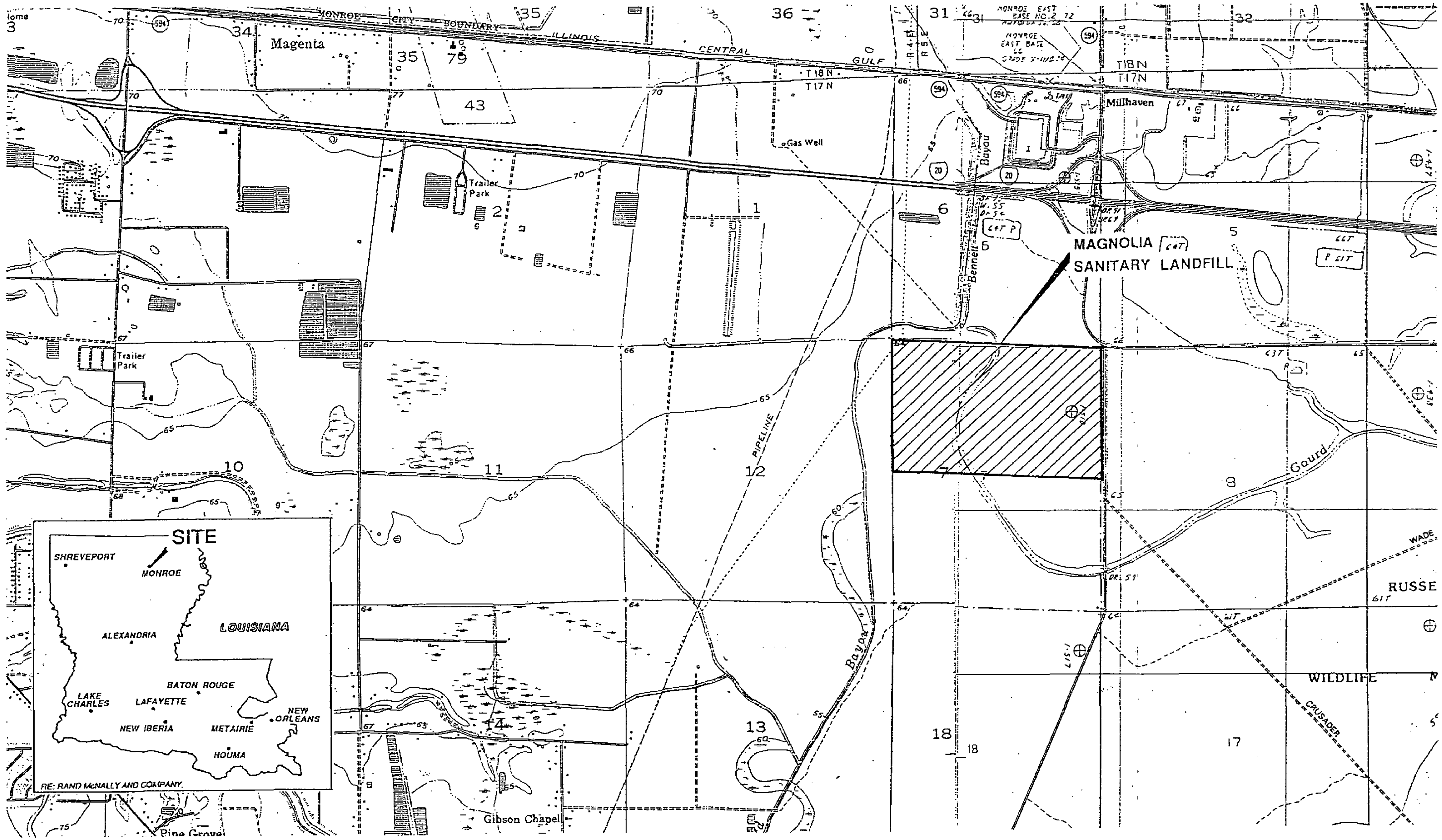
Corby T. Reeves, MBA
Director of Risk Management
St. Francis Medical Center

FACILITY CHARACTERISTICS DOCUMENTATION

EXHIBIT B

ORIGINAL CONTOUR PLAN
(LAC 33:VII.521.B.1 AND 521.C.1.A)

EXHIBIT B.1



Re: USGS Quadrangle Maps, 7.5 minute series. Monroe North, La. 1975, Monroe South, La. 1975 and Crew Lake, La. 1982.

RUST ENVIRONMENT & INFRASTRUCTURE

DATE	NO.	REVISION	BY

Waste Management of Louisiana, Inc.
Monroe, Louisiana
CLIENT

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

ORIGINAL CONTOUR PLAN

B.1
Exhibit

DRAWN BY J. PARTIN
CHECKED BY
APPROVED BY
DRAWING NO. 86415 CON

FACILITY SURFACE HYDROLOGY

EXHIBIT C

ARMY C.O.E. LETTER REGARDING
FLOODPLAIN ELEVATION
(LAC 33:VII.521.C.1.A; 521.C.1.E AND 711.A.1)

DEPARTMENT OF THE ARMY

VICKSBURG DISTRICT, CORPS OF ENGINEERS
4155 CLAY STREET
VICKSBURG, MISSISSIPPI 39183-3435

REPLY TO
ATTENTION OF:

June 21, 2005

Operations Division
Regulatory

SUBJECT: Magnolia Sanitary Landfill, Solid Waste Permit Renewal, Ouachita Parish, Louisiana

Ms. Susan Douglas
Sigma Engineers & Constructors, Incorporated
10305 Airline Highway
Baton Rouge, Louisiana 70816

Dear Ms. Douglas:

We have received your correspondence, subject as above, on June 20, 2005. We are working diligently to reply to you in a timely manner. For ease of reference, we assigned your correspondence an identification number, MVK-2005-865. Please refer to this number should you write or call us about your request.

If you have any questions about the status of your request, please call this office at 601-631-5165.

Sincerely,

Elizabeth S. Guynes

Elizabeth S. Guynes
Chief, Regulatory Branch

SIGMA
ENGINEERS &
CONSTRUCTORS, INC.

A SIGMA COMPANY IN ASSOCIATION
WITH SIGMA CONSULTING GROUP, INC.

INDUSTRIAL, ENVIRONMENTAL,
STRUCTURAL, MECHANICAL,
PROCESS, ELECTRICAL,
INSTRUMENTATION

Stephen J. Brasuell, P.E.
President

Michael N. Dooley, M.B.A., P.E.
Vice-President

Paul R. Schneider
Vice-President

Daniel B. Kais, P.E.
Vice-President

June 2, 2005

Department of the Army
Corps of Engineers
Vicksburg District
Engineering Division: Hydraulics
P.O. Box 60
Vicksburg, MS 39180-0060

RE: Magnolia Sanitary Landfill
Monroe, Ouachita Parish
Solid Waste Permit Renewal Application

Gentlemen:

Sigma Engineers & Constructors, Inc., on behalf of Waste Management of Louisiana, LLC (WML), hereby submits a request for information, specifically for the 100 year flood elevation for the northern half of Section 7, T17N, R5E in the vicinity of Monroe, Louisiana. Our request is made pursuant to the Magnolia Sanitary Landfill renewal application for a solid waste permit. A copy of the May 4, 1984 correspondence transmitting this flood elevation is attached. The facility is located off of Louisiana Highway 594 approximately one half mile south of Interstate 20 A site location map is attached.

Thank you in advance for your expedient handling of our request. If you have any questions or need additional information please contact me at (225) 298-0111, Extension 156.

Sincerely,
SIGMA ENGINEERS & CONSTRUCTORS, INC.

Susan Douglas

Susan Douglas

Attachments

c: M. Noel
50504 File

10305 Airline Highway • Baton Rouge, Louisiana 70816 • Phone (225) 298-0800 • Fax (225) 298-0255
E-mail: sigmacg@sigmacg.com • Web Page: www.sigmacg.com

DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT. CORPS OF ENGINEERS
P. O. BOX 60
VICKSBURG, MISSISSIPPI 39180

REPLY TO
ATTENTION OF:

May 4, 1984

Engineering Division
Hydraulics

Mr. Noble Hatch
Terry Denmon and Associates
3016 Cameron Street
Monroe, Louisiana 71203

Dear Mr. Hatch:

In response to your telephone request to Mr. Johnny Sanders of our Hydraulics Branch on May 3, 1984, the 100-year flood elevation in the north 1/2, Section 7, T17N, R5E in the vicinity of Monroe, Louisiana, is 66.8 feet NGVD and the highest observed stage at the site is 66.4 feet NGVD.

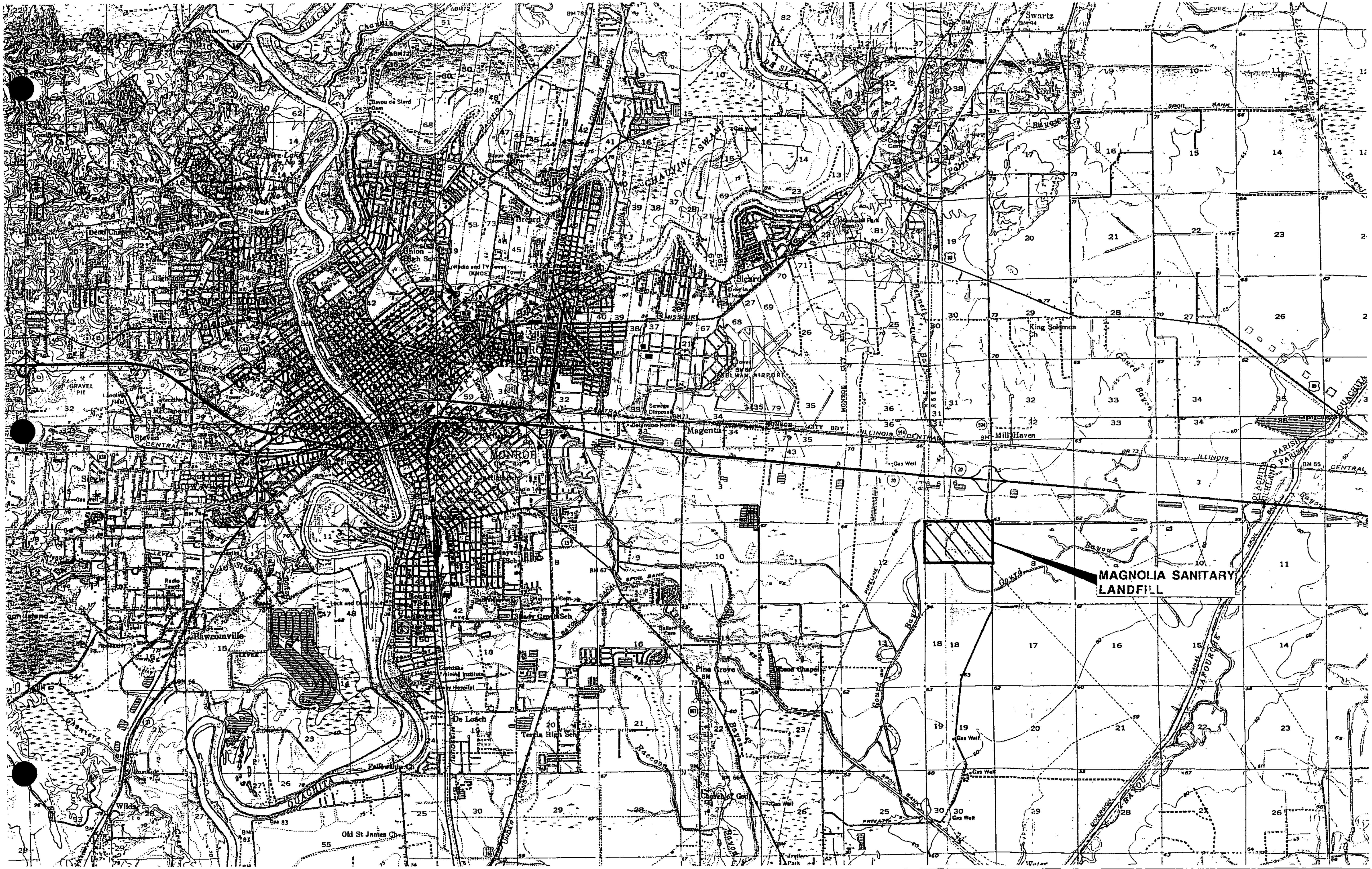
If we can be of further assistance, please contact us.

Sincerely,

James D. Arnold

John E. Henley
for Chief, Engineering Division

BEST COPY



MAGNOLIA SANITARY LANDFILL
MONROE
OUACHITA RIVER
CHAUVIN SWAMP
Magenta
Mill Haven
Sicard
King Solomon Ch
Pine Grove
De Loach
Swartz
Bawcomville
Old St James Ch
SELMAN AIRPORT
ILLINOIS CENTRAL
MISSOURI PACIFIC
OUACHITA PARISH
RICHLAND PARISH

ARMY C.O.E. LETTER REGARDING
SITE DRAINAGE AND FLOODWAY ENCROACHMENT
(LAC 33:VII.521.C.1.A; 521.C.1.E AND 711.A.4)

EXHIBIT C.2

DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT, CORPS OF ENGINEERS
4155 CLAY STREET
VICKSBURG, MISSISSIPPI 39183-3435

REPLY TO
ATTENTION OF:

http://www.mvk.usace.army.mil/

July 8, 2005

Engineering Division
Hydraulics

Ms. Susan Douglas
SIGMA Engineers & Constructors, Inc.
10305 Airline Highway
Baton Rouge, Louisiana 70816

Dear Ms. Douglas:

I refer to your letter of June 27, 2005 concerning the Magnolia Sanitary Landfill renewal application.

At this time there is no need to update the information and recommendations contained in our letters of October 24, 1984 and January 22, 1985.

I trust this information will meet your needs. If we can be of further assistance, please contact Mr. Frankie Griggs at 601-631-5671.

Sincerely,

Robert H. Fitzgerald
Robert H. Fitzgerald, P.E.
Chief, Engineering Division

SIGMA ENGINEERS & CONSTRUCTORS, INC.
A SIGMA COMPANY IN ASSOCIATION WITH SIGMA CONSULTING GROUP, INC.

INDUSTRIAL, ENVIRONMENTAL, STRUCTURAL, MECHANICAL, PROCESS, ELECTRICAL, INSTRUMENTATION

Stephen J. Brasnell, P.E.
President

Michael N. Dooley, M.B.A., P.E.
Vice-President

Paul R. Schneider
Vice-President

Daniel B. Kais, P.E.
Vice-President

June 27, 2005

Department of the Army
Corps of Engineers
Vicksburg District
Engineering Division: Hydraulics
3909 Halls Ferry Road
Vicksburg, MS 39180

RE: Magnolia Sanitary Landfill
Monroe, Ouachita Parish
Solid Waste Permit Renewal Application

Gentlemen:

Sigma Engineers & Constructors, Inc., on behalf of Waste Management of Louisiana, LLC (WML), hereby submits copies of correspondence received from the Vicksburg Engineering Division-Hydraulics regarding site drainage and floodplain issues for the Magnolia Sanitary Landfill located in the northern half of Section 7, T17N, R5E in the vicinity of Monroe, Louisiana. Specifically we are requesting information regarding the need to update information and recommendations received from the Vicksburg Engineering Division on October 24, 2004 and January 22, 1985. Our request is made pursuant to the Magnolia Sanitary Landfill renewal application for a solid waste permit. The facility is located off of Louisiana Highway 594 approximately one half mile south of Interstate 20 A site location map is attached.

Thank you in advance for your expedient handling of our request. If you have any questions or need additional information please contact me at (225) 298-0111, Extension 156.

Sincerely,
SIGMA ENGINEERS & CONSTRUCTORS, INC.

Susan Douglas

Susan Douglas

Attachments

c: M. Noel
50504 File

10305 Airline Highway • Baton Rouge, Louisiana 70816 • Phone (225) 298-0800 • Fax (225) 298-0255
E-mail: sigmacg@sigmacg.com • Web Page: www.sigmacg.com

DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT. CORPS OF ENGINEERS
P. O. BOX 60
VICKSBURG, MISSISSIPPI 39180-0060

REPLY TO
ATTENTION OF:

October 24, 1984

Engineering Division
Hydraulics

Mr. Terry D. Denmon, P.E.
Terry Denmon and Associates
P. O. Box 8460
Monroe, Louisiana 71211

Dear Mr. Denmon:

In response to your October 4, 1984, letter, Hydraulics Branch has reviewed your plans for a sanitary landfill involving the north ½ of Section 7, T-17-N, R-5-E, Ouachita Parish. This proposed landfill will have negligible impact on Bayou Lafourche flood stages. However, the proposed fill will cross a natural depression that presently provides an auxiliary outlet to Gourd Bayou which drains a large area north of Interstate 20. Although this outlet is used only for large storms, blockage or significant encroachment into this floodway could raise flood stages upstream. Therefore, efforts should be made to compensate for any blocked drainage or encroachment into the floodway.

Please contact us if we can be of further assistance.

Sincerely,

James D. Arnold

John E. Henley
Chief, Engineering Division

DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT. CORPS OF ENGINEERS
P. O. BOX 60
VICKSBURG. MISSISSIPPI 39180 -0060

REPLY TO
ATTENTION OF:

January 22, 1985

Engineering Division
Hydraulics

Mr. Terry D. Denmon, P.E.
Terry Denmon and Associates
P. O. Box 8460
Monroe, Louisiana 71211

Dear Mr. Denmon:

I regret that we are unable to give you more specific data than our October 24, 1984 response to your inquiry. I reiterate that your proposed sanitary landfill in the north ½ of Section 7, T-17-N, R-5-E, Ouachita Parish, Louisiana, should have insignificant impact on Bayou Lafourche flooding. Insignificant impact can be defined here as being less than 0.1 foot. Because it is located 2.6 miles from the Bayou Lafourche channel, the impact of this fill is very small when considering overbank storage reduction or blockage of the overbank floodway.

In response to the blockage on the Gourd Bayou floodway, I suggest your proposed perimeter ditch have equivalent or more flowage capacity as the 48-inch CMP through the road on the east border of Section 7 as this appears to be the flow control section in that vicinity. These ditches must be maintained after construction to prevent vegetation from decreasing the flow capacity.

I hope this information will meet your needs and please feel free to contact us if we can be of further assistance.

Sincerely,

James D. Arnold

John E. Henley
Chief, Engineering Division

ARMY C.O.E. LETTER REGARDING
SITE DRAINAGE AND THE GOURD BAYOU FLOODWAY
(LAC 33:VII.521.C.1.A; 521.C.1.E AND 711.A.4)

DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT, CORPS OF ENGINEERS
4155 CLAY STREET
VICKSBURG, MISSISSIPPI 39183-3435

REPLY TO
ATTENTION OF:

http://www.mvk.usace.army.mil/

July 8, 2005

Engineering Division
Hydraulics

Ms. Susan Douglas
SIGMA Engineers & Constructors, Inc.
10305 Airline Highway
Baton Rouge, Louisiana 70816

Dear Ms. Douglas:

I refer to your letter of June 27, 2005 concerning the Magnolia Sanitary Landfill renewal application.

At this time there is no need to update the information and recommendations contained in our letters of October 24, 1984 and January 22, 1985.

I trust this information will meet your needs. If we can be of further assistance, please contact Mr. Frankie Griggs at 601-631-5671.

Sincerely,

Robert H. Fitzgerald
Robert H. Fitzgerald, P.E.
Chief, Engineering Division

SIGMA
ENGINEERS &
CONSTRUCTORS, INC.
A SIGMA COMPANY IN ASSOCIATION WITH SIGMA CONSULTING GROUP, INC.

INDUSTRIAL, ENVIRONMENTAL,
STRUCTURAL, MECHANICAL,
PROCESS, ELECTRICAL,
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Paul R. Schneider
Vice-President

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Vice-President

Daniel B. Kais, P.E.
Vice-President

June 27, 2005

Department of the Army
Corps of Engineers
Vicksburg District
Engineering Division: Hydraulics
3909 Halls Ferry Road
Vicksburg, MS 39180

RE: Magnolia Sanitary Landfill
Monroe, Ouachita Parish
Solid Waste Permit Renewal Application

Gentlemen:

Sigma Engineers & Constructors, Inc., on behalf of Waste Management of Louisiana, LLC (WML), hereby submits copies of correspondence received from the Vicksburg Engineering Division-Hydraulics regarding site drainage and floodplain issues for the Magnolia Sanitary Landfill located in the northern half of Section 7, T17N, R5E in the vicinity of Monroe, Louisiana. Specifically we are requesting information regarding the need to update information and recommendations received from the Vicksburg Engineering Division on October 24, 2004 and January 22, 1985. Our request is made pursuant to the Magnolia Sanitary Landfill renewal application for a solid waste permit. The facility is located off of Louisiana Highway 594 approximately one half mile south of Interstate 20 A site location map is attached.

Thank you in advance for your expedient handling of our request. If you have any questions or need additional information please contact me at (225) 298-0111, Extension 156.

Sincerely,
SIGMA ENGINEERS & CONSTRUCTORS, INC.

Susan Douglas

Susan Douglas

Attachments

c: M. Noel
50504 File

10305 Airline Highway • Baton Rouge, Louisiana 70816 • Phone (225) 298-0800 • Fax (225) 298-0255
E-mail: sigmacg@sigmacg.com • Web Page: www.sigmacg.com

DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT, CORPS OF ENGINEERS
P. O. BOX 60
VICKSBURG, MISSISSIPPI 39180-0060

REPLY TO ATTENTION OF:

October 24, 1984

Engineering Division
Hydraulics

Mr. Terry D. Denmon, P.E.
Terry Denmon and Associates
P. O. Box 8460
Monroe, Louisiana 71211

Dear Mr. Denmon:

In response to your October 4, 1984, letter, Hydraulics Branch has reviewed your plans for a sanitary landfill involving the north ½ of Section 7, T-17-N, R-5-E, Ouachita Parish. This proposed landfill will have negligible impact on Bayou Lafourche flood stages. However, the proposed fill will cross a natural depression that presently provides an auxiliary outlet to Gourd Bayou which drains a large area north of Interstate 20. Although this outlet is used only for large storms, blockage or significant encroachment into this floodway could raise flood stages upstream. Therefore, efforts should be made to compensate for any blocked drainage or encroachment into the floodway.

Please contact us if we can be of further assistance.

Sincerely,

John E. Henley
Chief, Engineering Division

DEPARTMENT OF THE ARMY
VICKSBURG DISTRICT, CORPS OF ENGINEERS
P. O. BOX 60
VICKSBURG, MISSISSIPPI 39180 - 0060

REPLY TO
ATTENTION OF:

January 22, 1985

Engineering Division
Hydraulics

Mr. Terry D. Denmon, P.E.
Terry Denmon and Associates
P. O. Box 8460
Monroe, Louisiana 71211

Dear Mr. Denmon:

I regret that we are unable to give you more specific data than our October 24, 1984 response to your inquiry. I reiterate that your proposed sanitary landfill in the north ½ of Section 7, T-17-N, R-5-E, Ouachita Parish, Louisiana, should have insignificant impact on Bayou Lafourche flooding. Insignificant impact can be defined here as being less than 0.1 foot. Because it is located 2.6 miles from the Bayou Lafourche channel, the impact of this fill is very small when considering overbank storage reduction or blockage of the overbank floodway.

In response to the blockage on the Gourd Bayou floodway, I suggest your proposed perimeter ditch have equivalent or more flowage capacity as the 48-inch CMP through the road on the east border of Section 7 as this appears to be the flow control section in that vicinity. These ditches must be maintained after construction to prevent vegetation from decreasing the flow capacity.

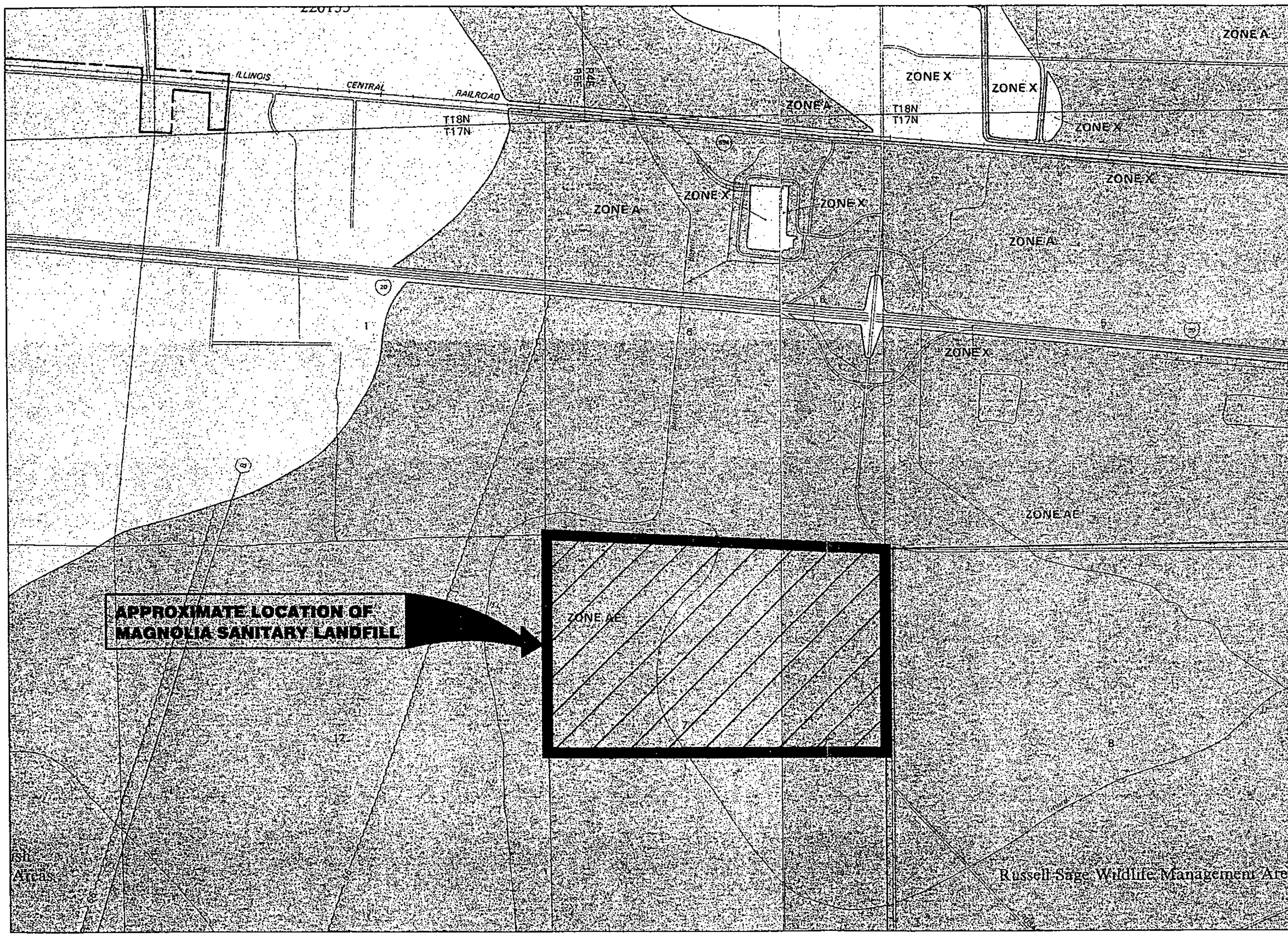
I hope this information will meet your needs and please feel free to contact us if we can be of further assistance.

Sincerely,

James D. Arnold
for John E. Henley
Chief, Engineering Division

100-YEAR FLOOD PLAIN MAP
(LAC 33:VII.521.C.1.A)

EXHIBIT C.4



LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- **ZONE A** No base flood elevations determined.
- **ZONE AE** Base flood elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding; velocities also determined.
- **ZONE A99** To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.
- **ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- **ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- **ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside 500-year floodplain.
- **ZONE D** Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS†

Identified 1983 | Identified 1990 or later | Otherwise Protected Areas

†Coastal barrier areas are normally located within or adjacent to special flood hazard areas.

- Floodplain Boundary
- Floodway Boundary
- Zone D Boundary
- Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.
- 513 — Base Flood Elevation Line; Elevation in Feet*
- D — D Cross Section Line
- (EL 987) Base Flood Elevation in Feet Where Uniform Within Zone*
- RM7 X Elevation Reference Mark
- •M1.5 River Mile

*Referenced to the National Geodetic Vertical Datum of 1929

100 YEAR FLOODPLAIN MAP
MAGNOLIA SANITARY LANDFILL
WASTE MANAGEMENT OF LOUISIANA

AUGUST, 2005

WM WASTE MANAGEMENT | SIGMA ENGINEERS & CONSTRUCTORS

DESIGNED	DRAWN	CHECKED	APPROVED
DLS	DOH		

DATE	DESCRIPTION REVISIONS	BY

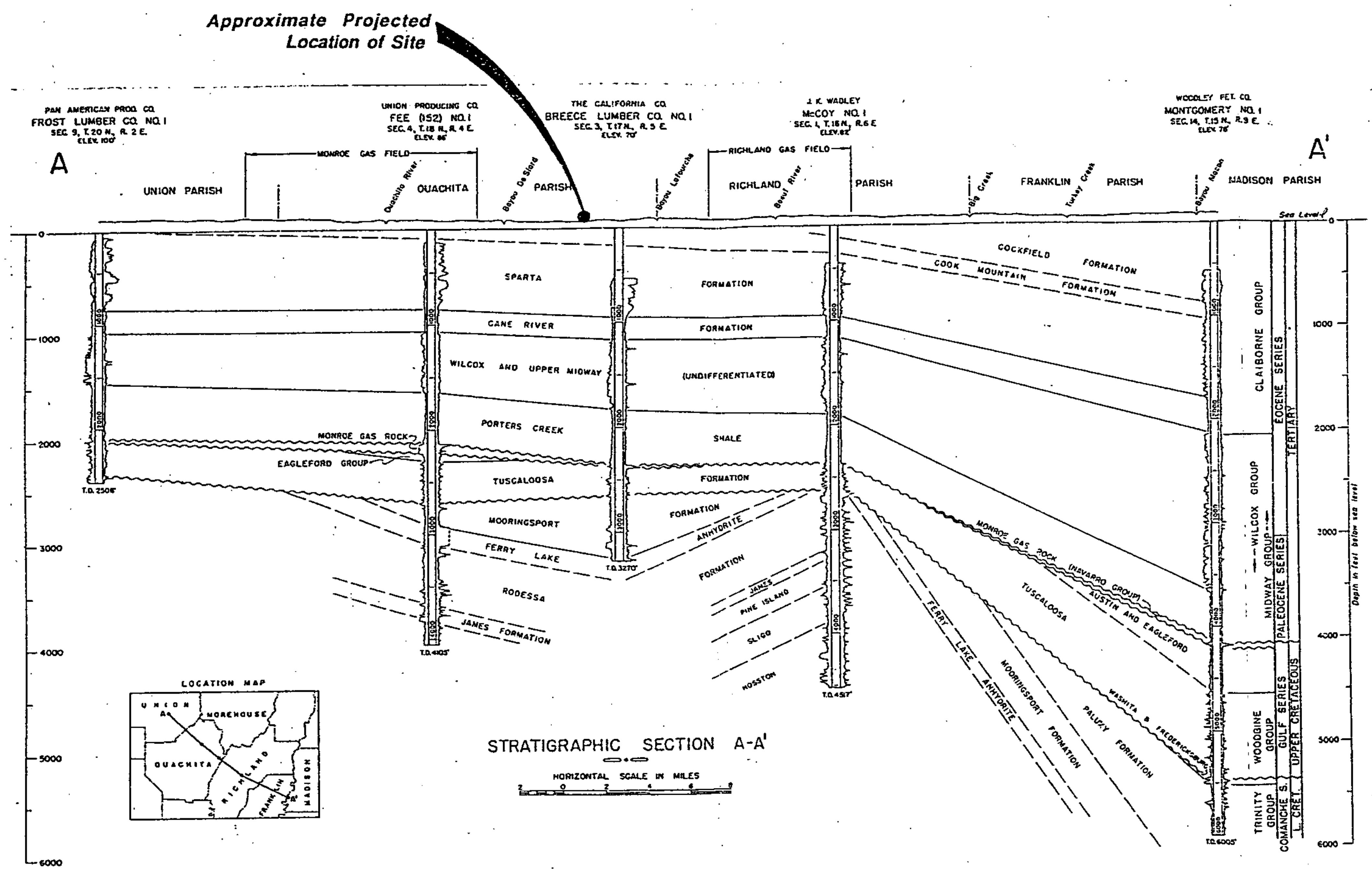
SOURCE: QUACHITA PARISH PANELS 75 AND 80 OF 140 FIRM MAPS (MARCH 15, 1994)

FACILITY GEOLOGY

EXHIBIT D

GENERALIZED GEOLOGIC CROSS SECTION
(LAC 33:VII.521.D.1.D AND 709.C.3)

EXHIBIT D.1



DATE	NO.	REVISION	BY

Waste Management of Louisiana, Inc.
Monroe, Louisiana
CLIENT

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

RUST ENVIRONMENT & INFRASTRUCTURE

GENERALIZED GEOLOGIC CROSS-SECTION

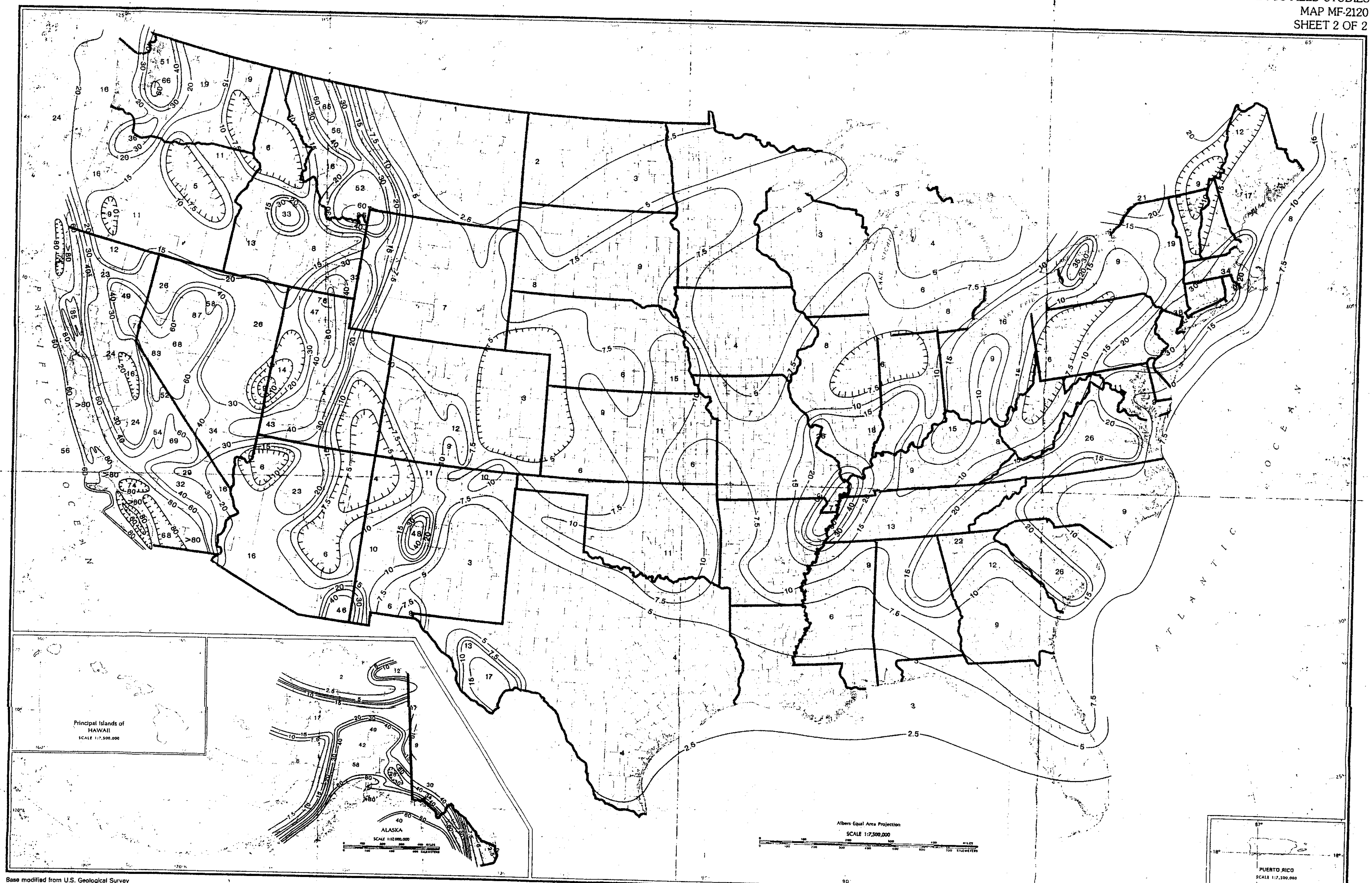
D.1
Exhibit

DRAWN BY J. PARTIN
CHECKED BY
APPROVED BY
DRAWING NO. 88415 GEO.SECT.

USGS MISCELLANEOUS
FIELD STUDIES MAP

DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-2120
SHEET 2 OF 2



Base modified from U.S. Geological Survey National Atlas, 1970

MAP C.-HORIZONTAL ACCELERATION (90 PERCENT PROBABILITY OF NOT BEING EXCEEDED IN 250 YEARS)

EXPLANATION

—5— Contour--Horizontal acceleration expressed as percent of gravity. Some areas show acceleration values without contours. Hachures indicate closed area of lower acceleration. No data available for Hawaii and Puerto Rico

USGS MISCELLANEOUS FIELD STUDIES MAP

METES AND BOUNDS DESCRIPTION
(261.30A)

APPENDIX A

Commencing from a found 1½" iron pipe being the NE corner of Section 7, T-17-N, R-5-E, said point being the POINT OF BEGINNING; thence, S 00° 01' 15" E a distance of 2,640.64' to a found 3/4" iron pipe; thence, N 87° 07' 25" W a distance of 4,296.13' to a found 1" iron pipe; thence, N 00° 01' 01" E a distance of 2,665.90' to a found 3" iron pipe; thence, S 86° 47' 10" E a distance of 4,295.73' back to the POINT OF BEGINNING and the NE corner of Section 7, said tract containing 261.30 acres, more or less, all located in Section 7, T-17-N, R-5-E, Ouachita Parish, Louisiana.

METES AND BOUNDS DESCRIPTION
(0.16A)

APPENDIX B

Commencing from a found 1½" iron pipe being the NE corner of Section 7, T-17-N, R-5-E, said point being the POINT OF BEGINNING; thence, N 86° 47' 10" W along the north section line of Section 7 a distance of 80.13 feet to a point; thence, N 00° 01' 15" W a distance of 107.56 feet to a point on the south right-of-way of La. Highway 594; thence, around the arc of a curve to the left whose chord bears S 62° 16' 51" E a distance of 90.39 feet to a point on the south right-of-way of La. Highway 594 with its intersection of the east line of Section 6, T-17-N, R-5-E; thence, S 00° 01' 15" E along the east section line a distance of 70.01 feet back to the POINT OF BEGINNING and the NE corner of Section 7, said tract containing 0.16 acres, more or less, all located in Section 6, T-17-N, R-5-E, Ouachita Parish, Louisiana.

BUFFER ZONE REDUCTION CONSENT

APPENDIX C

TO WHOM IT MAY CONCERN:

As the owner of the Ouachita Parish property being leased by American Waste & Pollution, Inc. for a sanitary landfill plus that parcel adjoining the western limits of said site, I do herewith give my permission to reduce regulated buffer zone requirements to 100 feet along that, the western boundary, line.

Consent is given on the th day of July 1984 and shall remain in effect for the life of the referenced lease.

Hershel R. Sullivan

Hershel R. Sullivan
501 Shenandoah Dr.
Monroe, Louisiana 71203

Buffer Zone Waiver

466

1196039

AFFIDAVIT

FILED & RECORDED
CLERK & RECORDER
OUACHITA PARISH, LA

MAR 12 3 48 PM '97

STATE OF LOUISIANA

PARISH OF OUACHITA

BEFORE ME, the undersigned Notary Public, personally came and appeared Louisiana Wildlife and Fisheries, duly represented herein by Jerald Owens, its Supervisor for Wildlife and Fisheries, District 2 (hereinafter "appearer").

Who, after being duly sworn, did depose:

Appearer is the Owner of a certain piece of property, described as the NW/4 of Section 8, Township 17 North, Range 5 East, found in Book 470, Pages 195-200, said property being adjacent to and adjoining the property of Magnolia Sanitary Landfill (hereinafter the "facility"); that appearer waives a buffer zone of two hundred feet (200') between the facility and the property line of appearer (hereinafter the "buffer zone"); and that the appearer waives any objection to, and grants permission for, the construction, placement, existence and /or operation of gas flares, gas extraction devices, and/or gas-to-energy facilities or units within the buffer zone.

Jerald J Owens

SWORN TO AND SUBSCRIBED before me, this 12th day of March, 1997.

NOTARY PUBLIC

PROFESSIONAL ENGINEER CERTIFICATIONS

ENGINEERING CERTIFICATION

I certify under penalty of law that I have personally examined and I am familiar with the information submitted in this permit application and the facility as described in this permit application meets the requirements of the Solid Waste Rules and Regulations. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment.

Dale L. Steib, P.E.
Professional Engineer #28229
Sigma Engineers and Constructors, Inc.

STATE OF LOUISIANA
DALE L. STEIB
REG. No. 28229
REGISTERED
PROFESSIONAL
ENGINEER
IN
CIVIL ENGINEERING

APPENDIX D

I, Terry D. Denmon, Registered Professional Engineer in the State of Louisiana do hereby certify that the engineering documents prepared for the permit application for American Waste & Pollution Control, Inc., to be located in the North one-half of Section 7, T-17-N, R-5-E, Ouachita Parish, meet the requirements for a sanitary landfill as defined by the Louisiana Solid Waste Rules and Regulations, to the best of my knowledge and belief.

Terry D. Denmon

TERRY D. DENMON, P.E.

Southwestern Laboratories represented by Lloyd Hoover, a licensed professional engineer specializing in geotechnical engineering, hereby certifies that the on site soils at the proposed Magnolia Sanitary Landfill Site are of sufficiently low permeability to provide an adequate barrier in accordance with the requirements of the Louisiana Solid Waste Rules and Regulations.

Lloyd G. Hoover

LLOYD G. HOOVER, P.E.

ENGINEERING CERTIFICATION

I certify under penalty of law that I have personally examined and I am familiar with the information submitted in this permit application and the facility as described in this permit application meets the requirements of the Solid Waste Rules and Regulations. I am aware that there are significant penalties for knowingly submitting false information, including the possibility of fine and imprisonment.

STATE OF LOUISIANA
TERRI L. RICHARDSON
REG. No. 24659
REGISTERED
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
10/10/96

Terri L. Richardson, P.E.
Professional Engineer #24659
Rust Environment & Infrastructure, Inc.

REPORT ON GEOTECHNICAL INVESTIGATION AND LANDFILL DESIGN – RUST E & I

APPENDIX E

RUST ENVIRONMENT & INFRASTRUCTURE

Report on

GEOTECHNICAL INVESTIGATION AND LANDFILL DESIGN

FOR

MAGNOLIA SANITARY LANDFILL

OUACHITA PARISH, LOUISIANA

Prepared by:

RUST Environment & Infrastructure
8919 World Ministry Avenue, Suite 201
Baton Rouge, Louisiana 70810

October 1996

Quality through teamwork

TABLE OF CONTENTS

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LIST OF DESIGN DRAWINGS

LIST OF ATTACHMENTS

1.0 INTRODUCTION

RUST Environment & Infrastructure (RUST E&I) was retained by Waste Management of Louisiana, Inc. (WML) to perform design modifications for the Magnolia Sanitary Landfill. The re-design of future landfill cells has been performed to comply with the new requirements of the Louisiana Solid Waste Rules and Regulations (LSWRR), promulgated February 20, 1993. The LSWRR regulations incorporated the requirements of the Environmental Protection Agency's (EPA) Subtitle D regulations and, therefore, the revised design presented in this report also meets the requirements of Subtitle D. Additionally, RUST E&I was retained to conduct additional hydrogeological investigations to redesign the groundwater monitoring network in accordance with the LSWRR and comments from the Louisiana Department of Environmental Quality (LDEQ) Solid Waste Division personnel.

Magnolia Sanitary Landfill was originally leased and operated by American Waste and Pollution Control (AWPCC). The property was leased from Mr. Hershel Sullivan until 1992, at which time the property was purchased by AWPCC. In 1992, the parent company of AWPCC, Waste Management of North America, Inc., underwent reorganization and AWPCC became WML. Therefore, Magnolia Sanitary Landfill is currently owned and operated by WML. The site is situated in Ouachita Parish approximately 1.5 miles east of Monroe, Louisiana and approximately 1 mile south of U.S. Interstate 20 on Millhaven Road. The total site area encompasses 261 acres, of which approximately 57 acres have been landfilled and approximately 204 acres are currently permitted but not yet landfilled. An area vicinity map showing the location of the landfill is provided as Figure 1. A site plan showing the layout of the landfill and other site features is presented as Figure 2. The landfill is permitted to accept municipal and industrial solid waste.

A geotechnical investigation of the site was performed in 1984 by Southwestern Laboratories and the original landfill design was performed by Terry D. Denmon & Associates. The original permit application was submitted to the Louisiana Department of Environmental Quality in May 1985, and permit approval was granted in 1985. Numerous permit modifications have been submitted since the original permit application. Currently, Cells 1 through 7 of the landfill, which were constructed in accordance with the earlier design, are filled and closed. Cells 8 through 11 were constructed in accordance with a modified design and are accepting waste. Therefore, the revised design presented in this report pertains to future cells developed at the landfill.

1.1 OBJECTIVES

This report presents the findings of a geotechnical/hydrogeological investigation performed by RUST E&I in 1993 and additional information obtained during supplemental investigations by RUST E&I in 1996 to meet the requirements of the current LSWRR for site characterization and support of a revised groundwater monitoring network design. This report also presents the revised design developed to meet the requirements of the LSWRR and Subtitle D. This report is organized as follows: 1) background overview and history of previous investigations performed at the site; 2) regional setting of the site; 3) details of the 1993 and 1996 RUST E&I geotechnical/hydrogeologic investigations; 4) discussion of landfill design; 5) discussion of the engineering calculations and analyses; and, 6) discussion of construction and operations considerations. Supporting tables, figures, design drawings, and calculations (in Attachments) are also presented in this report.

2.0 BACKGROUND

2.1 SITE LOCATION AND PHYSICAL DESCRIPTION

The existing Magnolia Sanitary Landfill site is situated in Ouachita Parish approximately 1.5 miles east of Monroe, Louisiana and approximately 1 mile south of U.S. Interstate 20 on Millhaven Road. Specifically, the site is situated within section 7 of township 17 north and range 5 east. The total site area encompasses 261 acres, of which approximately 204 acres is permitted for landfilling. Eleven refuse cells, designated 1 through 11, have been constructed and received waste prior to October 9, 1993. Cells 1 through 11 occupy an area of approximately 57 acres. In addition to the landfill areas, the facility contains a scale/office building, a vehicle maintenance building, a sedimentation pond, and an oxidation pond. A second oxidation pond is proposed as part of the re-design. A detailed site plan illustrating the facility layout and the filled and unfilled landfill areas is presented as Figure 2.

2.2 SUBSURFACE SITE INVESTIGATIONS

To date, a total of four subsurface investigations have been conducted at the Magnolia Sanitary Landfill. These investigations include a geotechnical investigation performed by Southwestern Laboratories (SWL) in 1984, a groundwater monitoring well installation program performed by Soil Testing Engineers, Inc. (STEI) in 1985, and the RUST E&I subsurface investigations performed in 1993 and 1996.

A total of 106 subsurface borings have been installed within the existing boundaries of the facility. This includes 95 geotechnical/exploratory borings, nine groundwater monitoring wells, two observation wells (that have been plugged and abandoned), and seventeen piezometers. Of the 95 geotechnical borings installed, eight of the borings were advanced to 18 to 33 feet below ground surface (bgs), 45 were advanced to 45 feet bgs, 37 were advanced to 50 feet bgs, one was advanced to 86 feet bgs and four were advanced to 100 feet bgs. The screened depths of the nine groundwater monitoring wells range from approximately 35 to 53 feet bgs, and the two observation wells were reportedly screened at approximately 100 feet bgs. The screened depths of piezometers P-1 through P-3 ranged from approximately 9 to 20 feet bgs (RUST E&I, 1993) and piezometers PZ-10 through PZ-16, PZ-17A-D, and PZ18A-D ranged from approximately 13 to 86 feet bgs (RUST E&I, 1996). The SWL and STEI investigations are described in the following sections, and the findings of the RUST E&I investigation are presented in Section 4.0.

2.2.1 Geotechnical Investigation by Southwestern Laboratories - 1984

SWL conducted a geotechnical investigation on the site in 1984 which included: 1) installation of 45 soil borings; 2) geotechnical testing of selected soil samples; 3) installation of two observation wells; 4) observation of groundwater levels; and, 4) in-situ field permeability tests in three of the borings. This investigation was conducted in two phases. Borings B-1 through B-9 were drilled at the site in May 1984 during the Phase I portion of the investigation. Borings B-10 through B-16, borings B-20 through B-48 and the two observation wells were drilled in July 1984 as part of the Phase II portion of the investigation. The soil borings were installed on an approximate grid spacing of 450 feet by 500 feet, as shown on Figure 3, Boring & Piezometer Location Plan. All of the these borings were completed to a depth of 45 feet bgs and the two observation wells were reported as being completed to a depth of 100 feet bgs. A total of 2,225 linear feet of boring were drilled. The borings were advanced by rotary wash methods utilizing ATV-mounted drilling equipment. The sampling protocol (continuous sampling or sampling on five-foot centers) varied from boring to boring, but typically consisted of continuous sampling to 25 bgs then on five-foot centers thereafter. Relatively undisturbed samples of cohesive and semi-cohesive soils were collected using a three-inch diameter thin-walled Shelby tube sampler. The soils encountered were logged in the field by a soils technician or a geologist.

Geotechnical testing was performed on selected soil samples to determine pertinent physical characteristics including permeability, strength, and classification. A detailed description of this investigation including a summary of all site activities and copies of soil boring logs can be found in the SWL report entitled "Subsurface Exploration for Magnolia Sanitary Landfill" dated August, 1984, revised February, 1985.

Groundwater levels were recorded in all of the borings in an attempt to determine static water levels beneath the site. Additionally, two observation wells, designated OW-1 and OW-2, were reported to be installed to a depth of 100 feet bgs in order to establish long-term ground water observations. Observation wells OW-1 and OW-2 were installed along the north and south side of the facility, respectively. These wells could not be found during a recent site visit; therefore, it is believed that the two observation wells were abandoned during the development of the landfill facility. No records could be located by WML or the Louisiana Department of Transportation and Development (LDOTD). The LDOTD "Water Well Rules, Regulations, and Standards, State of Louisiana" dated November 1985, Section 1.3.2.0.B., state that the owner is not required but "may" register any uninventoried water well installed prior to November 1985. However, the Department has the authority to obtain well data and records upon request.

In-situ field permeability tests were conducted in soil borings B-25, B-32 and B-37. The field permeability tests were completed for each of the three different strata (Strata I through III) identified by SWL during the investigation. Details of these tests are summarized on pages 133 and 134 of the SWL report.

2.2.2 Monitor Well Installation by Soil Testing Engineers, Inc. - 1985

Soil Testing Engineers, Inc. (STEI) installed nine groundwater monitor wells, designated MW-01 through MW-09, in 1985. The locations of the groundwater monitor wells are shown on Figure 3. This investigation was performed in order to comply with the requirements of the standard operating permit and to provide a groundwater monitoring network for the development of a site specific groundwater monitoring plan. The groundwater monitoring network established background (baseline) data for the site and a brief interpretation of the hydrogeological conditions at the site. Each well, ranging in depth from 35 to 53 feet bgs, is screened in the same water-bearing silty sand to sand (SM-SP) zone. Two of the wells, MW-01 and MW-02, serve as upgradient monitoring points while the remaining groundwater monitor wells are considered to be downgradient. The monitor wells were installed using the wet rotary drilling method. Each well was advanced to within a few feet of the top of the stratum to be monitored referencing it to the nearest SWL boring. Sampling was then performed into and through the stratum to be screened to ensure that the proper stratum had been reached in accordance with the SWL geotechnical investigation. Once the proper monitor well placement depth had been determined, each well was installed in accordance with the established LSWRR and LDOTD requirements. The monitor wells were constructed of two inch diameter, Schedule 40, flush threaded PVC well pipe with 0.010-inch slotted screens. A protective aluminum casing was placed over each well upon completion of the well installation. A concrete pad and four protective steel posts were placed around each well to allow easy access and to provide visibility of the well for protection purposes. These monitor wells were installed prior to November, 1985 and were never registered with the LDOTD. Technically, these monitor wells may not be required to be registered with the LDOTD, although the LDOTD does have the authority to request any available well information.

Following the placement of the protective casings, pads and posts, the wells were properly developed by flushing the wells with clean, potable water followed by the removal of several well volumes of water. The "vapor lift" method was utilized to purge (remove) the necessary well volumes of water. The wells were purged with compressed nitrogen until the water entering the well was clear and the flow rate during recovery was adequate. Approximately 10 to 20 well volumes of water were removed from each well to achieve proper performance which is based on recovery rate and water quality. A detailed description of this investigation, including a summary of all site activities and copies of monitor well construction details, can be found in the STEI report entitled "Monitor wells and QC/QA Inspection Services" dated October 31, 1985.

3.0 REGIONAL SETTING

A review of the literature and previous subsurface investigations was conducted to develop an overview of the geologic setting of the site. Publications of state and federal agencies as well as site-specific information from field and laboratory data were included. The geologic review encompassed regional geology and hydrogeology, geologic structures, and local hydrogeology.

3.1 GEOGRAPHY

Ouachita Parish covers an area of 643 square miles and is bordered by Union, Morehouse, Richland, Caldwell, Jackson and Lincoln Parishes. Much of the land is comprised of agriculture and timber land. Cotton is the primary crop, followed by soybeans, rice, grain, sorghum and sweet potatoes. The total parish population of 142,000 people (1990 census) ranks 8th most populous among the 64 parishes within the state. Approximately 78 percent of the total population live in urban areas such as Monroe, Bastrop and West Monroe. Approximately 75 percent of the total population is considered to be above the standard poverty level. The five largest public and private employers of the parish, beginning with the largest, include: 1) Riverwood Forest Products, 2) Ouachita Parish School System, 3) St. Francis Medical Center, 4) Monroe City School System, and 5) Northeast Louisiana University.

3.2 CLIMATE

The climate of the parish is classified as modified sub-tropical. The summers are long and warm, and the winters are short and mild. Annual rainfall averages approximately 54 inches. The month receiving the most rainfall is typically July and the least is October. The 25-year, 24-hour maximum rainfall event for the area is approximately 8 inches. However, torrential showers, sometimes accompanying hurricanes, have produced as much as twelve inches of rain within a 24 hour period. The monthly and annual temperature and rainfall data from the National Oceanic and Atmospheric Administration (NOAA) at the Monroe Airport station is provided in Appendix A. This station is located approximately 12,000 feet to the northwest of the landfill.

The temperature in the area generally range from 35 to 93 degrees Fahrenheit (°F). The warmest month is July while the coolest is January with mild frosts generally occurring from late November to late February. The average ambient air temperature is 65°F. The monthly average temperature data from the NOAA Monroe Airport station is provided in Attachment A, along with Annual Summary Wind Roses (1961-1980) for the Shreveport and Baton Rouge stations.

3.3 REGIONAL AND SITE TOPOGRAPHY

Ouachita Parish is located in the central portion of the northern half of Louisiana and is situated in the Coastal Plain physiographic province. The parish is bisected by the boundary between the Mississippi Alluvial Plain section on the east and the West Gulf Coastal Plain on the west. This physiographic boundary trends essentially north-south, thus, the parish can be simply divided physiographically into an eastern half (alluvial or floodplain area) and a western half (hill section) consisting of dissected upland, underlain by rocks of Tertiary age. Basically, this division is best represented by the Ouachita River which divides the hill land and the alluvial land. Magnolia Sanitary Landfill is located in the eastern half (alluvial section) of the parish. This alluvial land is in the floodplain of the Ouachita River and Bayou Lafourche. The alluvial half of the parish shows the typical features of a floodplain area over which frequently overloaded streams have meandered seaward. These features include natural levees, ox-bow lakes, meander scars, back swamps and rim swamps. The relief is generally very low across the alluvial area. A majority of the area falls between the 55-foot and 70-foot national geodetic vertical datum (NGVD, formerly mean sea level) contours with some higher elevations of 75 to 85 feet NGVD on the natural levees and some lower elevations of 35 to 45 feet NGVD along the Ouachita River. Local relief over areas of several square miles is commonly less than 5 feet and much of the land appears perfectly flat. Scattered small streams with narrow, low natural levees drain the area. The average slope of the alluvial land towards the Gulf is inconspicuous, being on the order of about one-half (1/2) foot to the mile. In the southern half of the alluvial land is a general eastward slope of one to two feet per mile towards Bayou Lafourche. The alluvial plain is traversed along its western boundary by the meandering Ouachita River and in its northern part by Bayou De Siard.

The general topographic configuration in the area of the existing site is presented on Figure 1. The land surface of the site and surrounding areas is relatively flat with elevations at the site ranging from approximately 61 to 64 feet NGVD. The surface of the site slopes southward with a gradient of approximately 0.05%.

3.4 SURFACE WATER FEATURES

In general, scattered streams with narrow natural levees drain the area of northeastern Louisiana including Ouachita Parish and the area of the site. Major streams of Ouachita Parish include (listed from east to west): 1) Bayou Lafourche, 2) Bayou De Siard, and 3) the Ouachita River. Bayou De Siard is actually a lake that is technically a tributary of the Ouachita River which has been dammed to form a lake. Geographically, Bayou Lafourche marks the east boundary between Ouachita and Richland Parishes and the Ouachita River forms a dividing line separating the parish in two sections (the hill land and the alluvial land). In the area of Ouachita Parish, these surface streams generally flow north to south and meander within narrow but well-defined alluvial valleys. Important lakes located across the parish include: Bayou De Siard which serves as a reservoir for the City of Monroe, Black Bayou Lake which is interconnected with Bayou De Siard, Lake Bartholomew located to the north of the parish, and Brake Cheniere which is located in the western portion of the parish and has a surface area of over 2,600 acres. Figure 4 illustrates the principal drainage features in the region.

In relation to parish-wide surface water features, Magnolia Sanitary Landfill is located between two generally parallel-flowing major tributaries; the Ouachita River to the west and Bayou Lafourche to the east. The landfill is located on the former channel of Gourd Bayou which at one time traversed the site. This portion of Gourd Bayou proceeds east-southeast ultimately joining Bayou Lafourche approximately three miles east of the site. Gourd Bayou Improved represents the modifications of Gourd Bayou and has been re-routed along the west side of the landfill site. Gourd Bayou Improved continues in a southerly direction and empties to Youngs Bayou approximately two and three-fourths (2-3/4) miles south of the site. Youngs Bayou proceeds in a southeasterly direction and is a tributary of Bayou Lafourche. Additionally, Bennett Bayou enters the area of the site from the north and joins Gourd Bayou Improved to the northwest of the facility.

3.5 REGIONAL GEOLOGY

Sediments exposed at the surface in Ouachita Parish consist of the Cook Mountain and Cockfield formations of the Claiborne group, Prairie terrace deposits of the Pleistocene Series, a few remnants of older Pleistocene terrace deposits, and Recent alluvial deposits. The site of Magnolia Sanitary Landfill is located on exposures of the Recent alluvial deposits. Material encountered in the shallow subsurface during the geotechnical investigations is generally consistent with published descriptions of the Recent alluvial deposits and ranged approximately 70 to 75 feet in thickness.

The stratigraphy in the area of the site is in the descending group order of Recent alluvium, Claiborne, Wilcox, and Midway. There is a possibility that older pleistocene terrace deposits may also exist. A geological map and a generalized geological cross section for the area showing the approximate location of the site and the subsurface stratigraphy beneath the site are presented as Figures 5 and 6, respectively. The Claiborne group is generally composed of the Cockfield, Cook Mountain, Sparta, and Cane River formations. The Cane River and Sparta formations are present in the subsurface throughout Ouachita Parish. The Cook Mountain is present beneath most of the parish and outcrops in the northwestern corner of the parish. The Cockfield is the surface rock in the major portion of the hill section and, except for a few outcrops, it is not exposed in the alluvial section of the parish. The following sections presents a brief summary of the Recent alluvium and Claiborne (Reference 1 and 2).

3.5.1 Recent Alluvium

The Recent alluvium in Ouachita Parish consists of two main types: Arkansas River materials, probably derived from the Ozark region with characteristic purplish color and composed mainly of clay and silt; and, Ouachita River materials consisting predominately of clay and silt from light to dark gray, reddish brown, and dark bluish-gray colors. Sand and gravel, probably consisting of reworked Pleistocene materials, are found localized in stream beds. The dark bluish clays are locally calcareous and occasionally contain gravel (not of pleistocene terrace deviation) and limestone pebbles. The Arkansas River and Ouachita River materials are interbedded in the eastern portion of the parish where the Arkansas River and Ouachita River have at one time or another been the major streams. The Recent alluvium in Ouachita Parish is generally found on Cook Mountain beds and has an average thickness estimated at 100 feet.

3.5.2 Cockfield Formation

The Cockfield formation is anywhere from non-existent to 300 feet thick in Ouachita Parish. The top of the Cockfield is not present in the parish; but has been eroded away. The highest bed remaining is the middle Cockfield. In the lower topographic levels, it is found only as outcrop. The formation consists of beds of lignitic sand, silt, and clay of continental to littoral origin. The sands generally are very fine to fine grained and individual beds may reach 100 feet or slightly more in thickness. In general, the thicker sand beds are in the lower part of the formation. The thick sand may contain thin layers of clay or sandy clay. In the area of the site, the Cockfield formation is not believed prevalent under Recent alluvium material.

3.5.3 Cook Mountain Formation

The Cook Mountain formation is composed of fossilliferous marine clay, marl, and glauconitic sand and shale. This formation ranges in thickness from about 100 feet in northeast Louisiana to about 300 feet in central Louisiana, where it dips down to the southeast toward the axes of the Mississippi structural trough and the Gulf geosyncline. In Ouachita Parish, the Cook Mountain formation is exposed in the northwestern corner of the parish and a few places along the Ouachita River and Bayou d'Arbonne during low water stages where it consists of interbedded sandstones and sandy shales. The contact between the Cook Mountain and the overlying Cockfield is not sharply defined lithologically. Approximate contact of the two units has only been documented in the northwest portion of the parish and along the Ouachita River and Bayou d'Arbonne during low water stages. During the RUST E&I investigation, the top of the Cook Mountain formation was encountered approximately 70 to 75 feet bgs.

3.5.4 Sparta Formation

The Sparta formation ("Sparta sand" aquifer) is present in the subsurface throughout the parish. In Ouachita Parish, Sparta sand ranges in thickness from about 500 to 900 feet with an average thickness of 650 feet. The lower half of the Sparta sand is made up chiefly of massive sand with interbedded subordinate members of laminated sandy clay. The massive sands are made up of quartz grains somewhat coarser than found in the Wilcox formation. The upper half contains a relatively greater amount of clay than the lower half. Massive sands alternate with beds of finely laminated sandy clay, in part lignitic and in many places containing fossil leaves. The upper 50 feet of beds contain a considerable amount of lignitic material and some thin lignitic beds. The Sparta sand aquifer is the primary source of all fresh groundwater for the area.

3.5.5 Cane River Formation

The Cane River formation is present in the subsurface throughout the parish. In Ouachita Parish, the Cane River ranges in thickness from about 330 to 370 feet. This formation is quite distinct from the underlying Wilcox group, but the upper portion may be confused with the Sparta sand above, into which it is transitional. The Cane River is not a source of fresh water, but it retards movement of water between the overlying Sparta sand (fresh water) and the underlying salt water-bearing sands of the Wilcox group. The Cane River formation is marine, gray-green, glauconitic sandy silt and shale overlain by chocolate-brown silty shale. The lower part of the Cane River is calcareous and contains abundant microfauna.

As shown on the Regional Geologic Isometric Profile presented as Figure 6, the uppermost 70 to 75 feet of soils underlying the site of Magnolia Sanitary Landfill consist mainly of Recent alluvial deposits underlain by soft weathered to unweathered shale rock of Cook Mountain formation to the maximum depth explored of 100 feet bgs.

3.6 REGIONAL HYDROGEOLOGY

A review of the Water Resources of Ouachita Parish, Louisiana, Water Bulletin No. 14, Department of Conservation, Louisiana Geological Survey and Louisiana Department of Public Works, Baton Rouge, Louisiana, 1972 (Reference 3), reveals that fresh groundwater occurs in Ouachita Parish in unconsolidated deposits of Eocene, Pleistocene and Holocene ages. The aquifers are considered to be the same as the geological units; however, not implying that all of any geological unit will yield water. The overlying Claiborne group of Eocene age provides most of the fresh groundwater supplies for this area. The alluvium, which ranges in age from Pleistocene to Holocene, forms the youngest water-bearing unit in the area. The alluvium is thick enough to be considered a significant source of water only beneath the Ouachita valley.

The Sparta sand, which is the most important source of ground water in Ouachita Parish has an average thickness of approximately 650 feet. Regional dip of the beds across the parish is about 6 to 8 feet per mile toward the east (in a few places the dip appears to be as much as 50 feet per mile). These seemingly steeper dips may result from local structure or a buried erosional surface rather than regional dips. Thick sands may be found anywhere within the Sparta sand interval; however, in some places there may be only thin sands or even silt and clay. Because the thick sands of the Sparta sand occur at different intervals of the formation, overlapping of the sands is probably common. This results in areal continuity of permeable zones from the bottom to the top of the unit. This continuity is indicated by the response of water levels in all sands to the long-term withdrawals of water. Most of the pumpage is from the lower part of the formation.

In Ouachita Parish, water from the Sparta sand is used for municipal, industrial, domestic and, to a small extent, for irrigation needs. Yields of wells in the Sparta sand range from a few gallons per minute (gpm) for some 2-inch domestic wells to more than 1,800 gpm for some industrial wells. Industrial use of water from the Sparta sand is extensive. Many of the industrial wells in the parish yield from 500 to 700 gpm. These wells are screened in sands that are 80 to 200 feet or more in thickness. Some of the thinner sands can yield similar quantities of water if the wells are highly efficient. The municipal wells in West Monroe yield 500 to 900 gpm. Most wells serving suburban areas are designed for small yields, generally 200 gpm or less, although some wells yield only 30 to 50 gpm.

The Cook Mountain Formation is a source of water for domestic wells in the parish. The formation, which ranges from 150 to 200 feet in thickness, is made up of clays, silty clays, marls, and fine-grained glauconitic sands. Clay and silty clay form the bulk of the unit; sands irregularly occur aerially and vertically within the unit. The sands in the Cook Mountain are discontinuous and of limited areal extent. A number of wells east of the Ouachita River are screened in the Cook Mountain Formation. The stratigraphic position of the intervals indicates that the sands are uppermost Sparta or lowermost Cook Mountain. The Cook Mountain is developed in the eastern part of the parish as the most economical source of soft water for domestic users. Yields of more than 20 gpm are possible at some localities, but the discontinuity of the sands indicate that sustained yields at higher rates are improbable.

The Cockfield Formation occurs only locally in Ouachita parish. The limits are nearly the same as the outcrop areas; however, only the lower 150 to 250 feet of the Cockfield is present. The sands of the Cockfield Formation are very fine to medium grained, commonly massive and cross-bedded. Some of the sands are thin-bedded and are separated by thin layers of clay. On the surface these sands may be iron stained; in the subsurface they are lignitic and gray. The shallow domestic wells in the southwestern part of the parish yield water from the Cockfield. As the formation is thin and the surface is dissected deeply by streams, part of the sands of the Cockfield are unsaturated and reduce the potential of the unit as a source of water. Only small-capacity domestic wells yield water from the Cockfield in Ouachita Parish. Yields are 20 gpm or less. Demand for water is low in the southwestern part of the parish since the population density is low and the need for other than domestic supplies is slight. In addition, better quality water is available in the Sparta sand. However, in places where the sands are thick and saturated, wells yielding as much as 100 gpm are possible. Only limited sustained yields are possible due to the low specific capacities and limited drawdowns available because of the shallow depth of the sand. Sustained yields of 100 gpm would result in dewatering the unit in many places.

The terrace deposits west of the Ouachita River are a source of water for domestic wells. These deposits are relatively thin and rarely more than 100 feet thick. The terrace material is generally a basal gravel that grades upward into sand, silt, and clay. In the West Monroe area the silt and clay cover is thick and much of the deposit has been mined for gravel. Most of the terrace deposits are hydraulically connected with the alluvium except in areas where erosion has isolated segments of the terrace. Streams drain part of the terrace deposits in the hill land west of the Ouachita River.

The alluvium of the Ouachita River is developed as a source of water for domestic, stock, irrigation, and industrial uses. As previously mentioned, the alluvium forms the youngest water-bearing unit in the area; however, the alluvium is thick enough to be considered a significant source of water only beneath the Ouachita valley. In general, the alluvial deposits have basal gravel overlain successively by sand, silt, and clay. The surface of the alluvium is relatively flat. Land-surface elevations are as high as 80 feet along the natural levees of the Ouachita River. The surface slopes gently from the crest of these natural levees toward swamps that have elevations of 55 to 65 feet. The base of the alluvium, on the other hand, is very irregular since it rests on the eroded surface of the Cook Mountain Formation. Because of irregularities in the base of the alluvium, the thickness changes rapidly in short distances and ranges from 15 to 50 feet.

Test holes of the alluvium indicate that it is made up of saturated sand and gravel. During most of the year the water moves to points of discharge in the Ouachita River or Bayou Lafourche. At high stream stages the direction of movement near the streams is reversed for short periods of time. Some underflow in the alluvium enters the parish from the north; some leaves the parish to the south. However, most of the water in the alluvium probably enters the alluvium within the parish and is discharged to streams within the parish.

Review of the "Aquifer Recharge Potential of the Shreveport Quadrangle", Map #5 (1988) and the "Aquifer Recharge Potential of the Jackson Quadrangle", Map #6 (1988), of the Aquifer Recharge Atlas, Louisiana Geological Survey (Reference 4) and review of the Geologic Map of Louisiana (1984), Louisiana Geological Survey (Reference 5), indicates that the site is located in an area that does not recharge to underlying major Louisiana fresh water aquifer system. Aquifer recharge potential was evaluated based on the shallow soil conditions occurring within six feet of the ground surface.

4.0 SITE INVESTIGATION

The findings of the RUST E&I geotechnical investigation did not identify any areas of concern or other major discrepancies with the previous site investigations that would preclude the development of the existing landfill facility. The findings of this investigation including a summary of the subsurface conditions encountered and results of geotechnical testing and analyses, are presented in the following sections of this report.

4.1 FIELD EXPLORATION

RUST E&I conducted a geotechnical investigation in 1993 to obtain information on subsurface soil conditions to a maximum depth of 100 feet bgs. This investigation was performed as part of a re-design of the existing facility. In 1996 RUST E&I conducted a supplemental hydrogeological investigation in two phases to obtain additional site-specific hydrologic information to confirm the shallow groundwater flow regime at the site and determine the groundwater flow characteristics between Strata II and III. The following sections describe soil boring and piezometer installation activities conducted during the 1993 and 1996 investigations.

4.1.1 Geotechnical Borings

The geotechnical investigation conducted during 1993 consisted of the installation of 37 borings to 50 feet bgs, four borings to 100 feet bgs, and three piezometers (P-1, P-2 and P-3) to 15 to 20 feet bgs within the undeveloped area of the landfill. All of the borings and piezometers were installed and sampled in accordance with all applicable LSWRR (Reference 6). The borings and piezometers were located on the northeast, central, and western portions of the existing (undeveloped) landfill area. The borings, designated as R-1 through R-41, were installed at the locations shown on Figure 3. The four borings drilled to 100 feet bgs were numbered R-9, R-13, R-33 and R-36, and three piezometers were installed near borings R-3, R-7, and R-21. The first phase of the supplementary hydrogeologic investigation conducted during February 1996 included the sampling of eight borings to 18 to 33 feet bgs, one boring to 86 feet bgs and the installation of six piezometers (one screened from 76-86 feet bgs and five from 13 to 28 feet bgs) on the perimeter of the facility disposal footprint, predominantly along the southern portion of the site. Three of the nine soil borings were numbered B-PZ-13, B-PZ-13B and B-PZ-17 and grouted full depth following completion. The six remaining soil borings were converted to piezometers and were numbered B-PZ-10, B-PZ-11, B-PZ-12, B-PZ-14, B-PZ-15 and B-PZ-16. The location of these borings and piezometers are included on Figure 3.

The second phase of the supplemental hydrogeological investigation conducted during May 1996 included the installation of one nested piezometer set (PZ-17A-D) located adjacent to existing monitor well MW-6 and a separate nested piezometer set (PZ-18A-D) located near geotechnical soil boring R-33. The location of these piezometers are also provided on Figure 3.

All borings were sampled continuously to a depth of 50 feet then every five feet thereafter to completion, except for B-PZ-12, which was continuously sampled full depth. The boreholes for piezometers PZ-17A-D and PZ-18A-D were located near existing borings, therefore only the screened intervals were sampled to verify the screened matrix. Relatively undisturbed samples of cohesive materials were collected using a 3-inch diameter Shelby tube sampler. Shelby tube samples were hydraulically extruded in the field, visually classified, sealed with aluminum foil and plastic bags, placed in plastic canisters, appropriately labeled, then packaged in protective crates for transport to the laboratory.

Disturbed samples were obtained in cohesionless materials using a 24-inch split-spoon sampler (2-inch O.D. by 1.37-inch I.D.) in general accordance with ASTM specification D-1586. The split-spoon sampler initially was seated by driving it one 6-inch interval, then it was driven an additional two to three 6-inch intervals using a 140-pound safety hammer falling 30 inches. The number of blows required to drive the sampler during the second and third 6-inch interval is designated as the Standard Penetration Test (SPT) "N-Value", and is presented on the boring logs. After examining and classifying each sample, a representative portion from each sample was sealed in a plastic bag, appropriately labeled, then packaged in protective crates for transport to the laboratory.

In the field, all samples were visually classified in general accordance with the Unified Soil Classification System (approximately equivalent to ASTM D-2488). A summary of the Unified Soil Classification System can be found in Attachment B.1. The boring logs containing strata descriptions, sample depths, laboratory test results, and Unified Soil Classifications are also presented in Attachment B.1.

Upon completion, each boring was appropriately plugged and abandoned with a Portland Type I cement and 5 percent bentonite gel grout in accordance with LDEQ and LDOTD regulations (Reference 7). The grout was thoroughly mixed then weighed using a calibrated mud balance in accordance with ASTM D-4380. Upon achieving the specified weight and proper consistency, the grout was pumped to the bottom of the borehole through a tremie pipe, thus displaying that all remaining drilling fluid was displaced to the ground surface. The return grout was also weighed until the initial pump weight was reached.

4.1.2 Piezometer Installations

During 1993, three piezometers were installed at depths ranging from approximately 9 to 20 feet bgs. The piezometers, designated as P-1, P-2 and P-3, were installed at the locations shown on Figure 3. These piezometers were constructed of 1-1/4 inch diameter, Schedule 40, flush threaded PVC well pipe with 0.010-inch slotted screens. The piezometers were fitted with bottom plugs and vented end caps. The sand filter pack consisted of washed and pre-graded 20/40 sand, which extended from the bottom of the borehole to 2 to 3 feet above the top of each 5-foot screen. Following sand pack placement, a 1/4 inch diameter bentonite pellet seal, a minimum 3 feet thick, was placed atop the sand pack. After allowing a minimum 24 hour waiting period for the pellets to hydrate, a 5% bentonite and Portland Type I cement grout was tremied into the remaining annular space from the top of the bentonite seal to the ground surface. Surface completions consisted of steel 4 inch square box protective casings set in a 5-foot square concrete pad, 4 inches thick. Four protective guard posts were placed approximately 1 foot outside of each corner of the concrete pad.

The three piezometers were surveyed by Terry Denmon and Associates following construction. Site grid coordinates, along with elevations for the top of casing and ground surface were recorded. Each grid coordinate was then transferred into a latitude and longitude coordinate using a 7.5 minute USGS topographic map and existing site maps. This information, along with the piezometer number and screening information were stenciled onto a metal plate and rivetted to the inside of the protective steel cover.

In January and February 1996 six piezometers were installed at the facility, numbered PZ-10, PZ-11, PZ-12, PZ-14, PZ-15 and PZ-16. Upon completion of the soil boring to the target depth at which the expected unit was encountered (Stratum II or, for PZ-12, Stratum III), the borehole was reamed to a nominal diameter of eight inches. All piezometer screen and riser pipe consisted of 2-inch I.D., flush threaded, schedule 40 polyvinyl chloride (PVC). Screens were either 5 or 10 feet in length with 0.010-inch machined slots. Each piezometer was fitted with a 6-inch long bottom sump and a vented top-end cap. All joints were screwed together with O-rings or teflon tape; no glue was used. All piezometer screen and riser lengths were measured to the nearest 0.01inch and are recorded on Piezometer Construction Summaries presented in Attachment B.2.

In May 1996 eight piezometers (two nests) were installed at the facility, identified as PZ-17A-D and PZ-18A-D. All piezometer screen and riser pipe consisted of 0.75-inch I.D., flush threaded, schedule 80 polyvinyl chloride (PVC). Screens were 1 foot in length with 0.020-inch machined slots. All joints were screwed together with O-rings or teflon tape; no glue was used. All piezometer screen and riser lengths were measured to the nearest 0.01-inch and are recorded on Piezometer Construction Summaries presented in Attachment B.2.

Filter pack material for piezometers during January and February 1996 consisted of washed, fine (20/40) silica filter sand (95% minimum silica and visibly free of dust, mica, and organic matter) and was installed to approximately two feet above the top of the screen. Filter pack material for piezometers during May 1996 consisted of washed, medium (10/20) silica filter sand due to the larger slot diameter (0.02-inch). Two to three feet of fine silica sand was then placed above the filter sand to help prevent any intrusion of high pH water associated with the bentonite seal. Following placement of the sugar sand, a two to three-foot thick bentonite pellet seal was then installed above the fine sand. Approximately one foot of fine silica sand was then installed above the bentonite seal to provide weight during hydration of the bentonite seal and to help enhance the expansion of the pellets horizontally. After allowing a minimum of eight hours hydration time, the remaining borehole annulus was tremie grouted via a side-discharge tremie pipe from the top of the fine sand to within 5 feet of ground surface. The grout mixture consisted of Benseal™ bentonite, bentonite catalyst and clean potable water. The grout mixture was allowed a minimum of twelve hours for settlement. If necessary, more grout was added to bring the top of the grout to five feet bgs.

A Type I Portland cement grout was used to fill the five feet of annular space separating the top of the bentonite grout and the ground surface. Surface completion consisted of a vented, aluminum alloy 4.0-in. locking surface casing and a 5'x5'x6" sloping concrete pad with 4" diameter protective posts installed outside of the pad. A 1/4-inch drain plug or hole was installed just above the concrete pad. Bentonite pellets were placed in the annular space between the protective casing and riser to ground surface. Pea gravel was then placed from ground surface to six inches below the top of the riser. All piezometers are locked with keyed-alike locks. A summary of piezometer construction data is presented in Table 3.

The individual piezometer construction diagrams are presented in Attachment B.2. Copies of the piezometer registration forms submitted to the LDOTD by the subcontract water well driller are presented in Attachment B.3.

4.1.3 Piezometer Development

The piezometers were developed using the air-lift method to remove all fines and to establish proper hydraulic contact between the borehole and formation. An oil-less air compressor was used in air-lifting operations in order to reduce the potential of releasing any hydrocarbons into the groundwater. Due to low water yields in some of the piezometers, potable water obtained from the facility was induced down the piezometer in order to remove all fines and to achieve proper development. A copy of the piezometer development records are included within Attachment B.2.

4.1.4 Piezometer and Monitor Well Surveying

As a part of the second phase of the supplemental hydrogeological investigation, the top of PVC casing (TOC) for all groundwater monitoring wells and applicable piezometers were re-surveyed by Denmon Engineering Co., Inc. between May 30 and June 4, 1996 relative to NGVD. The revised TOC for each well and piezometer is included within Table 3. A copy of the certification by Terry Denmon, PLS, is included within Attachment B.3.

4.2 GEOTECHNICAL LABORATORY TESTING

Soil samples collected in 1993 were initially transported to the RUST E&I office and then selected samples were transported to the subcontracted laboratories for further testing. Geotechnical tests were performed by Soils and Foundation Engineers, Inc. and Soil Testing Engineers, Inc., both located in Baton Rouge, in order to evaluate and further classify the selected samples. Geotechnical laboratory testing was not performed during the 1996 Supplemental Hydrogeological investigation.

Atterberg Limits (ASTM D-4318), percent passing the number 200 mesh sieve (ASTM D-1140), and full gradation tests (ASTM D-422) were performed on selected soil samples to determine the index properties of the subsurface materials. A total of 64 Atterberg Limits, 16 minus number 200 sieve analyses, and 42 full gradation analyses were performed.

Bearing strength characteristics and the in-situ moisture and density of the soils were evaluated by means of triaxial unconsolidated-undrained compression tests (ASTM D-2850) and unconfined compression tests (ASTM D-2166). In addition, pocket penetrometer readings were taken in the field on cohesive soil samples and are presented on the boring logs. Two individual unit dry weight determinations, one triaxial unconsolidated-undrained compression, and 40 unconfined compression tests were performed. The classification and compression test results are summarized on Table 1. The individual test results are also presented on the borings logs and in Attachment C.

Two consolidation (odometer) tests (ASTM D-2435) were performed to evaluate the compressibility characteristic of cohesive materials subjected to increased loads. Stress-strain curves were plotted from the data obtained in the test. Engineering analyses based on these curves were used to estimate the probable magnitude of settlement of the tested soils under the applied loads. The stress-strain plotted during the tests are provided in Attachment C.3.

Horizontal and vertical permeability characteristics of the cohesive soils were evaluated by means of flexible wall permeability tests (ASTM D-5084). Five vertical permeability and three horizontal permeability tests performed. Permeability tests results are included in Table 1. The laboratory test data sheets are presented in Attachment C.4.

4.3 SITE GEOLOGY

The Magnolia Sanitary Landfill site is predominantly underlain by four soil strata to the maximum depth explored of 100 feet bgs. Beginning at the ground surface, a thick layer of competent, highly plastic and relatively low permeability clay (CH) soils were identified to approximately 15 feet bgs (Stratum IA) underlain by a silty clay-clay (CH-CL) layer between 15 and 30 feet bgs (Stratum IB). In isolated areas beneath the facility, a saturated 2 to 5-foot thick layer of predominantly clayey silt (ML) was encountered at a depth of 15 to 20 feet bgs (Stratum II). An isopach map depicting the areal distribution of Stratum II is included as Figure 13. This figure also indicates where Stratum II and Stratum III merge together (Stratum II/III, locations marked in red). Beneath these strata is a saturated silty sand to sand (SM-SP) unit (Stratum III) to a depth of approximately 70 to 75 feet bgs. These strata (Strata III and II/III) represent the Uppermost Aquifer which exists beneath the site. A soft to very stiff marine clay (Stratum IV) underlies this unit in it's entirety beneath the facility and is consistent with the Cook Mountain formation (Claiborne group) of Tertiary geologic age. This stratum represents the lower confining unit. An Isometric Profile of the soils encountered, with a description of each stratum, is presented on Figure 7. Various cross sections through the site illustrating the subsurface materials are presented on Figures 8A through 8E.

Generalized lithologic data on each of the units identified in the shallow subsurface at the site are summarized on the following table, along with approximated coefficients of permeability.

				Permeability	
Stratum No.	Depth to Top (feet)	Thickness (feet)	Predominant USCS	Vertical (cm/sec)	Horizontal (cm/sec)
IA	0	15	CH	1.0×10^{-8}	1.0×10^{-9}
II	15-20	2-5	ML	1.0×10^{-5}	1.0×10^{-5}
IB	15-30	0-15	CL-CH	5.0×10^{-7}	5.0×10^{-7}
III	15-30	40-60	SM-SP	1.0×10^{-4}	1.0×10^{-4}
IV	70-75	?	Shale	1.0×10^{-8}	1.0×10^{-9}

The data reported above for Strata I through III were derived from the logs of 95 exploratory borings that were installed to depths of 30 to 50 feet at the site during the SWL and RUST E&I geotechnical investigations. Data for Stratum IV was derived from five RUST E&I borings installed across the site to a depth of 86 feet (one) bgs and 100 feet (four) bgs. The soil stratigraphy encountered in the field was observed to be consistent with the documented geology of the area.

4.3.1 Geotechnical Test Results for Subsurface Soils

As part of the 1993 RUST E&I investigation, a substantial geotechnical laboratory testing program was performed. Liquid limits of the clay (CH) material encountered at the site ranged from 53 to 105, with plasticity indices ranging from approximately 31 to 74. Moisture content generally ranged between 20 and 40 percent near the surface. Individual results for undrained shear strength ranged from approximately 1,560 to 4,720 psf. In general, tests on samples that were described as slickensided (fractured) on boring logs yielded lower results. Slickensided samples were typically not remolded and retested, resulting in conservative undrained shear strengths. Vertical permeabilities of these materials ranged from 3 x 10^{-8} to 2 x $^{-}10$ cm/sec, and horizontal permeabilities ranged from 2 x 10^{-8} to 9 x 10^{-9} cm/sec.

Silty clay (CL) materials were determined to have liquid limits ranging from approximately 28 to 43 and plasticity indices ranging between 8 and 22. Moisture contents averaged approximately 25 percent across the site and ranged from 23 to 32 percent. Dry densities generally averaged approximately 100 pounds per cubic foot (pcf) and undrained shear strengths ranged in value from approximately 920 psf to 4,720 psf. Vertical and horizontal permeabilities ranged from 3 x 10^{-7} to 5 x 10^{-7} cm/sec.

Cohesionless silty sands and sands were encountered below the clay and silty clay stratum. Standard penetration tests conducted within the stratum indicated a loose to very dense consistency. Strength was observed to increase with depth along with particle size. In-situ field permeabilities of these materials ranged from 1 x 10^{-5} to 1 x 10^{-6} cm/sec.

The underlying clayey shale stratum of Cook Mountain formation was observed to have undrained shear strengths in excess of 4,500 psf based on standard penetration and pocket penetrometer test results. Unconfined compressive strength tests could not be performed due to the limited recovery and quality of the sample. Rock coring was not performed during the investigation and deemed unnecessary. Vertical permeability of the shale (Stratum IV) was approximately 5 x 10^{-9} cm/sec with horizontal permeability expected to be slight higher due to the blocky structure of the shale.

4.4 SHALLOW GROUNDWATER CONDITIONS

The horizontal groundwater flow regime at the Magnolia Sanitary Landfill was evaluated during the 1993 site investigation. The completion of a supplemental hydrogeological investigation of the site in 1996 confirmed the horizontal flow regime at the site and determined the vertical flow regime within, and between, Strata II and III. Assessment activities conducted during 1996 included the installation of piezometers within Stratum II and Stratum III adjacent to existing monitor wells installed within Stratum III to determine the horizontal and vertical flow regime at the site in order to develop a conceptual flow net. This information was evaluated to determine the optimum groundwater monitoring network to effectively monitor downgradient of the facility to detect a potential release. Historical groundwater elevations are presented in Table 2. The following sections describe the hydrogeologic conditions at Magnolia Sanitary Landfill in greater detail.

4.4.1 Shallow Groundwater Flow Regime

As a part of the supplemental hydrogeological investigation, a determination of the shallow groundwater flow regime within Strata II and III was conducted. Depth to water measurements were collected by RUST E&I personnel on February 12 and 27, 1996 for all site monitor wells and piezometers installed as a part of the first phase of the supplemental hydrogeological investigation. Depth to water measurements were collected by RUST E&I personnel on June 25, 1996 for all site monitor wells and piezometers included within the study. The depth to water measurement from each well or piezometer was subtracted from a surveyed reference datum (top of PVC casing) in order to determine potentiometric head elevations at each well location. The potentiometric elevations were interpolated between data points using linear interpolation (where possible) to develop potentiometric contour maps for each stratum for each date. Potentiometric contour maps for Stratum II and Stratum III on February 12 and 27, respectively, are included herein as Figures 9A through 9D. The potentiometric contour map for Stratum III and II on June 25 are included as Figures 9E and 9F, respectively. These maps indicate a consistent south to southeast flow direction for Stratum II. The overall direction of groundwater flow in Stratum III is to the south-southeast. Hydraulic gradient for Stratum II during the sample dates was approximately 0.001 ft/ft while Stratum III has a hydraulic gradient ranging from approximately 0.0005 ft/ft to 0.001 ft/ft.

4.4.2 Calculation of Horizontal Flow Velocities

In-situ hydraulic conductivity (slug) tests were performed in piezometers and monitor wells screened in both Stratum II and Stratum III using both rising head and falling head methodologies where possible. Results of these tests are summarized in Table 4 and are included as Attachment B.4. The horizontal hydraulic conductivity (K) ranged from 1.92 x 10^{-5} centimeters/second or cm/sec (P-2) to 3.54 x 10^{-3} cm/sec (PZ-10) in Stratum II. The hydraulic conductivity within Stratum III ranged from 2.53 x 10^{-3} cm/sec (MW-04) to 1.34 x 10^{-2} cm/sec (PZ-12). Based upon these results, the geometric mean of the horizontal hydraulic conductivity of Stratum II is approximately 1.06 x 10^{-4} cm/sec (0.30 feet/day), whereas Stratum III exhibited an average hydraulic conductivity of approximately 5.18 x 10^{-3} cm/sec (14.67 feet/day).

Based on the data collected during the 1996 investigation, the horizontal flow velocity of ground water within Stratum II and Stratum III can be estimated using an equation derived from Darcy's Law,

$$V = \frac{Ki}{n_e}$$

where:

V = velocity (length/time)
K = hydraulic conductivity (length/time)
I = hydraulic gradient (length/length)
n_e = effective porosity (decimal)

In-situ hydraulic conductivity conducted on piezometers completed within the Stratum II soils yielded a geometric mean for hydraulic conductivity of 1.06 x 10^{-4} cm/sec (0.30 ft/day). Based on a hydraulic gradient range of 0.001, an effective porosity for silt to sandy silt of 0.15 (Todd, 1980), groundwater velocity within the Stratum II soils was computed to be approximately 1 foot per year.

Similar calculations were conducted for Stratum III data, utilizing a geometric mean for hydraulic conductivity of 5.18 x 10^{-3} cm/sec (14.67 ft/day), the hydraulic gradient ranging from 0.0005 ft/ft to 0.001 and an effective porosity for sand of 0.25. The resulting groundwater velocity in Stratum III was computed to range from approximately 11 to 21 feet per year.

4.4.3 Evaluation of Vertical Hydraulic Gradients

An evaluation of vertical hydraulic gradients between Stratum II and Stratum III (and within Stratum III) was conducted in the downgradient location of the existing site which have nested piezometers/monitor wells (i.e. - piezometers/wells installed within discreet portions of the same stratigraphic unit, or within separate stratigraphic units, but are located within a close proximity to each other, generally within 15 feet). Evaluations of the vertical hydraulic gradients between nested wells were conducted based on discrete measurement events conducted on February 27 and June 25, 1996, respectively. A summary of the head differential and the resultant vertical hydraulic gradient between Stratum II and Stratum III and within Stratum III is provided on Table 5.

The evaluation of the hydraulic head data collected from piezometers installed within discreet portions of Stratum II and Stratum III during February 1996 indicated hydrostatic head differentials ranging from 0.05 to 0.25 feet. The evaluation of the hydraulic head data collected from piezometers installed within discreet portions of Stratum II and Stratum III during June 1996 indicated hydrostatic head differentials ranging from 0.01 to 0.34 feet. This data, when divided by the vertical linear distance between the two screens of the nested wells/piezometers produces the vertical gradient value in feet per foot.

The vertical gradients calculated for the nested wells/piezometers installed within discreet portions of Stratum II and Stratum III, respectively, from the June 25 measurement event ranged from 0.002 to 0.016 ft/ft. The vertical gradient calculated from piezometers installed within the sand portion of Stratum III from that event ranged from 0.005 to 0.017 ft/ft. The vertical gradient calculated from piezometers installed within the upper portion of Stratum III relative to the basal gravel of Stratum III (MW-06/PZ-12 and PZ-18C/PZ-18D) was 0.001 ft/ft during the June 25 event.

4.4.4 Conceptual Flownet

The hydrogeologic investigation included the use of geologic cross sections, potentiometric maps, soil boring logs, nested well hydrostatic head differentials, refractive indices and an isopach map of Stratum II to develop conceptual flownets of Stratum II and Stratum III, which comprise the Uppermost Aquifer where the two are merged. The conceptual flownet for the June 25 measurement event is included as Figures 14A-14C, respectively. The potentiometric elevation data were used to plot equipotential contours on a cross section of the southern portion of the Magnolia Sanitary Landfill that shows the nested well/piezometer locations. The groundwater flow component (vectors) were then added, and are oriented perpendicular to the equipotentials. The flownets were constructed on a 1:1 (vertical to horizontal) scale to provide a proper perspective for the flow components including the calculation of refractive indices for flow between matrices of varying hydraulic conductivities. Calculations of refractive indices between strata are included within Attachment B.5.

4.5 PROPOSED MONITORING WELL NETWORK

Evaluation of hydrogeologic data collected during the investigation conducted by RUST E&I between January and June 1996 provided additional information on which a monitoring well network for the Magnolia Sanitary Landfill can be established that meets or exceeds the current LSWRR. Upon evaluation of the hydrogeologic data collected from the site, both the upper-most water-bearing zone (Stratum II) and the Uppermost Aquifer (Stratum III) will be required to be monitored. However, these two stratigraphic units merge on the southern (downgradient) portion of the landfill to act as one hydrologic unit (Stratum II/III). Therefore, the proposed well spacing locations for the downgradient portion of the landfill includes maintaining one existing well installed within Stratum III (MW-08) and the installation of three additional downgradient wells (MW-14, MW-16 and MW-18), the upgrade of three piezometers (PZ-10, PZ-14, and PZ-15) to monitoring well status (MW-10, MW-15 and MW-17) to monitor the upper portion of Stratum II, and the installation of three downgradient wells (MW-11, MW-12 and MW-13) along the interface of Strata II and III to monitor groundwater quality in both stratigraphic units (acting as one hydrologic unit in these areas). The installation of these wells will assure that downgradient conditions within Strata II and III are adequately monitored while maintaining the maximum downgradient spacing requirements for a hydrologic unit of 800 feet. The proposed monitor well network is presented on Figure 15. Additional details, including screened intervals, pertinent elevations, and well coordinates are provided in the "Summary of Proposed Monitoring Wells", provided as Table 6.

Upgradient monitoring of Stratum II will be accomplished by the upgrade of piezometer PZ-16 to monitor well status (MW-19), whereas MW-02 (Stratum III) will be converted to piezometer status and will only be utilized for the establishment of background groundwater quality. Upgradient monitoring of Stratum III will be accomplished with existing monitor well MW-01. Therefore, in accordance with LAC 33:VII.709.E.1.b.ii., the proposed detection monitoring system will utilize a minimum of one upgradient groundwater monitor well per zone (MW-19 for Stratum II and MW-01 for Stratum III). Background data collected from monitor wells MW-01, MW-02, and MW-19 will be pooled into a single background set for statistical purposes to account for naturally occurring geochemical differences in groundwater quality due to lithologic variations within the strata.

As requested by LDEQ, monitor well MW-09, which will be converted to piezometer status, will be monitored for chlorides only until no longer required by the administrative authority. This piezometer will not be evaluated on a statistical basis, and will not be considered a part of the proposed facility groundwater monitoring well network. A concentration versus time chart will be prepared for this parameter in accordance with the Groundwater Sampling and Analysis Plan to evaluate whether increasing trends are evident. Monitor well MW-18 will replace MW-09 within the monitor well network to fulfill LAC 33:VII.709.E.1.b.iv spacing requirements. Existing monitor well MW-02 will be converted to piezometer status for the collection of background data in Stratum III and will not be considered a part of the proposed facility groundwater monitoring network. It should be noted that this upgradient piezometer, and any others, if installed, would be utilized solely for the purpose of establishing background groundwater quality and exceeds the regulatory requirements of LAC 33:VII.709.E.1.b.ii.

The statistical method of the evaluation of the groundwater quality data will be selected to minimize statistical false positives while maintaining a reasonable false negative rate due to spatial variability between upgradient and downgradient wells and the lithologic differences between Strata II and III, respectively. Upon collection of the background data set for each unit and LDEQ-SWD approval of the proposed groundwater monitoring network, the upgradient piezometer(s) may be plugged and abandoned in accordance with facility permit requirements and applicable LSWRR. Approval will be received from LDEQ-SWD prior to plugging and abandonment of piezometers.

5.0 LANDFILL DESIGN

Magnolia Sanitary Landfill has been redesigned in accordance with the LSWRR, dated February 20, 1993, and EPA's Subtitle D regulations, dated October 1, 1991. The landfill layout is shown on the Site Plan, presented as Figure 2. The general landfill layout, maximum depth of excavation, and height of final cover were determined during the design process through the engineering analyses discussed in Section 6.0 of this report. The landfill existing layout, final design, and various construction details are presented on Drawings No. 1 through 15, attached. The liner, leachate collection system, and final cover components of the landfill are discussed below.

5.1 COMPOSITE LINER SYSTEM

To meet current federal (40 CFR Part 258 Subpart D) and state regulations (LAC 33:VII.711.B.5.d), the liner system installed in future cells (Cells 12 through 25) of Magnolia Sanitary Landfill will consist of a minimum three-foot thick compacted clay liner with a remolded hydraulic conductivity of 1×10^{-7} cm/sec or less, overlain by a 60 mil high density polyethylene (HDPE) liner. This composite liner system will be installed over the entire floor and sideslope areas of the cells. A plan view of the completed liner system is shown on Drawing No. 3. As mentioned in Section 6.1.1, native soils available from the excavation of these cells will be used to construct the clay liner. The excavated soils will consist of plastic to highly plastic clays (CL - CH) that will meet the requirement for hydraulic conductivity, Atterberg limits (plasticity index between 10 and 40), and grain size (more than 50% passing number 200 sieve).

In areas where clay liner is to be constructed over an existing waste cell with interim cover, the upper six inches of interim cover shall be stripped and scarified prior to construction of the clay liner. Details of the liner and anchor trench for these areas are presented on Drawings No. 11 and 12, attached. Over the pre-Subtitle D cells (1-11) the existing clay will serve as the minimum three-foot thick compacted clay liner as required by the parameters in the "Quality Control Plan for Liner Construction and Maintenance' as presented in Appendix H. The 60 mil high density polyethylene (HDPE) liner will be then be placed.

Soils used for clay liner construction shall be free of debris and/or roots, and should be placed and compacted in accordance with the approved site quality assurance/quality control program.

The 60 mil HDPE liner shall also be constructed under the guidelines of the approved quality assurance/quality control (QA/QC) program.

5.2 LEACHATE COLLECTION SYSTEM

The leachate collection system (LCS) for Cells 12 through 25 of the landfill is designed to meet the requirements of LAC 33:VII.711.B.4. This design includes two-foot deep leachate collection trenches designed to collect leachate from a maximum 100-foot distance on each side of the trench. The floor area on each side of the LCS trenches is sloped toward the trench at a minimum two percent slope. The trenches will contain a six-inch diameter, Schedule 80, perforated PVC pipe surrounded by gravel. The gravel drain is encased in a geotextile filter fabric to provide filtration of fines.

A plan view of the leachate collection system is shown on Drawing No. 4. A cross section through the collection trench and LCS pipe detail are shown on Drawings No. 9 and 10. The gravel-filled collection trench is sloped on a minimum one percent slope toward a LCS sump, located at the outer edge of the cells. A one-foot thick sand drainage layer, with a minimum permeability of 1×10^{-2} cm/sec, overlies the geomembrane liner and LCS trenches. The sand drainage layer also acts as a filter to trap fines and prevent clogging of the leachate collection system. A minimum one-foot thick protective soil cover will overlie the sand drainage blanket. In lieu of soil, one foot of shredded tires providing a permeability greater than or equal to 1×10^{-3}cm/s may be used as the protective cover over the sand drainage blanket.

The slopes of areas overlying existing landfill cells are designed to include a drainage net (Poly-Net PN-3000 or equivalent) installed directly over the clay liner. A geotextile fabric will be installed over the drainage net to prevent clogging from fines. Installation of the drainage net and geotextile on these slopes will enhance the drainage of leachate from these areas, and was incorporated into the design because of the relatively long slopes which may be present in these areas. A two-foot thick protective soil cover will be installed over the geotextile to protect the geosynthetic materials of the liner and LCS. If shredded tires are used in conjunction with a drainage composite, then a minimum one-foot of granular material or soil shall be placed between the shreds and the drainage composite.

Leachate will be removed from each LCS sump through an 18-inch diameter (SDR 11) HDPE upslope riser pipe. A level sensor on the pump will trigger pumping when the leachate level is one foot higher than the invert of the LCS pipes that drain into the sump, in accordance with LAC 33:VII.711.B.4.vii.(h). In addition, Subtitle D requires a demonstration that the leachate head on the liner will be less than 30 centimeters (cm) at all points on the liner, excluding trenches and sumps. This demonstration was performed using the HELP (Hydrologic Evaluation of Landfill Performance, U.S. Army Corps of Engineers, Waterways experiment Station, September 1989) model to determine the impingement rate for leachate through a five-foot thick layer of waste (worst case analysis). The leachate impingement rate was then used in a calculation to determine the maximum head on the liner. This calculation is presented in Appendix J of the permit, and indicates that the proposed design will yield a maximum head of 26 cm on the liner, which is less than the maximum of 30 cm specified by Subtitle D.

5.3 LANDFILL CLOSURE COVER SYSTEM

For the top slopes, the final closure cover design consists of, on the top 4% slope a minimum 2-foot thick cohesive soil liner with a maximum permeability of 1 x 10^{-7} cm/sec, 60-mil textured HDPE liner (at the discretion of the owner/operator, a forty (40) mil flexible membrane liner (FML) or LDPE may be utilized in lieu of the sixty (60) mil HDPE liner), a drainage media (a geocomposite or equivalent material), and a minimum 1.5 foot thick vegetative soil cover. The upper six inches of the vegetative soil cover must be capable of sustaining vegetation. The side slopes will constructed with a minimum 2-foot thick cohesive soil liner with a maximum permeability of 1 x 10^{-7} cm/sec and a 6-inch thick vegetative soil cover. The final contours of this cover system are shown on Drawing No. 5, and a section through the final cover is shown on Drawing No. 12, attached. As indicated on Drawing No. 5, the minimum grade on the final cover is four percent and the maximum grade is 33 percent. At locations where the final cover ends (at the perimeter levees) or where it meets existing final clay cover material, a gravel toe drain replaces the lower six inches of the vegetative cover and the drainage material is extended outward from the cover to enhance drainage.

The closure cover will be constructed in phases over areas of the landfill that have achieved final grade. Typically, the maximum area over which a final cover will be installed at one time is a ten-acre cell. Details of the final cover installation methods and QA/QC plans for the soil cover and geosynthetic material installed as part of the final cover system are presented in the Closure and Post-Closure Plan for Magnolia Landfill, which is presented in Appendix T of the permit.

The closure cover design also includes surface water runoff control berms designed to control water from the upper slope area with a seven to ten percent grade and direct the runoff to a chute that runs down the 25 percent slope. The chute will be lined with an erosion control mat and grassed to minimize erosion. If significant erosion occurs in a chute, measures must be taken to slow the velocity of the water in the chute. These measures may include installation of a rock or sandbag lining.

5.4 GAS COLLECTION SYSTEM

Final closure of the landfill is projected to take place in phases, as maximum fill elevations are achieved. Preparation of a detailed gas collection system design is not warranted at this time; however, a conceptual gas collection system has been prepared to illustrate the type of system recommended for Magnolia Landfill and is presented on Drawings No. 13, 14 and 15.

6.0 ENGINEERING ANALYSES

The following sections present the results and methodologies of the engineering analyses pertaining to the design of the landfill.

6.1 EARTHWORK CALCULATIONS

6.1.1 Earth Mass Balance Calculations

An earth mass balance calculation was performed to compare the soil available from the on site excavation to the soil quantities required for the construction of the clay liner, the final closure cover, and vegetative soil cover. The average end area method (Reference 8) was used to calculate the quantities of clay available from the excavation of cells 12 through 25.

The majority of the material excavated will consist of highly plastic clays (CH). Some very silty clay to clayey silt (CL-ML, PI less than 10) layers were encountered in some of the borings located in the northeast landfill area. This material is located just below the landfill base and in some areas may require removal and replacement with a material that will provide more adequate base support during liner compaction activities. This material should only be used for daily cover due to its high permeability characteristics and wet to saturated state.

The quantity of material available from the excavation of cells 12 through 25, excluding the top six inches, is calculated to be approximately 1,386,000 cubic yards. The approximate volumes of clay required for the construction of the three-foot thick clay liner and 2-foot thick cohesive soil cover are 622,000 cubic yards and 651,000 cubic yards, respectively. The quantity of soil available for use as vegetative soil is approximately 94,225 cubic yards, while the required quantity is estimated to be 489,000 cubic yards. The above mentioned volumes are summarized in the following table:

Materials/Layers	Volume (c.y.)
Clay from excavation	1,386,000
Available topsoil	94,225
3' clay liner (amount required)	622,000
2' final cohesive cover (amount required)	651,000
1.5' vegetative cover (amount required)	489,000

Based on these estimates, an approximate net volume of 113,000 cubic yards of excavated clays are available for future use, but the volume of topsoil available from the excavation is not sufficient to meet the vegetative soil cover requirement. Approximately 395,000 cubic yards of the excavated clay material will have to brought to the site to satisfy the volume requirements for the vegetative soil layer. Approximately 44,000 cubic yards will be available for future use. The earth mass balance calculations are included in Attachment D.1.

6.1.2. Waste Volume Calculations

The approximate volume of landfill waste was calculated using the average end area method. The volume calculated excludes the bottom liner, final cover and leachate collection system. However, the volume does include daily cover material used during waste placement operations.
The currently permitted-airspace is approximately 14,082,155 cubic yards. The revised total airspace proposed in the permit modification (submitted in January 1993 by WML) was calculated to be approximately 24,191,000 cubic yards. The total airspace is increased to 30,550,924 cubic yards.

The landfill is estimated to contain approximately 8,600,000 cubic yards of waste at this time, based on an aerial survey conducted in July 2001. Based on this estimate, the total remaining waste volume including this proposed expansion is estimated to be approximately 21,950,000 cubic yards. The waste volume calculations are included in Attachment D.2.

6.2 GEOTECHNICAL CALCULATIONS

The following sections discuss the geotechnical analyses pertinent to the design of the landfill. The soil parameters used throughout the analyses are described and remained consistent for all calculations.

6.2.1. Basal Heave

During excavation, the overburden pressure on the underlying permeable layers is gradually relieved and the equilibrium condition (between the weight of the overlying soil and the hydrostatic forces in the underlying permeable layer) will eventually be disturbed if the depth of excavation is not limited. Bottom heave is a failure condition that occurs when the hydrostatic forces acting on the bottom of a soil layer of low permeability become greater than the overburden pressure from that layer resulting in an "uplift" at the bottom of that layer. Therefore, calculations were performed to determine a minimum excavation elevation (i.e., a maximum excavation depth) at which the equilibrium between the overburden pressure and the hydrostatic forces from the underlying permeable zones would be maintained or slightly exceeded. Basal heave calculations were performed at each RUST E&I boring location using an assumed unit weight of 110 pcf for the cohesive soil and a minimum factor of safety of 1.1 against a bottom uplift failure. East-West geological cross sections developed from the RUST E&I borings illustrate the top of the water bearing layer. These cross sections are presented on Figures 8A through 8E entitled "Geologic Cross Sections". Typical historical water levels acquired from the existing on-site groundwater monitor wells were used to plot a potentiometric map for the landfill and the water level at each RUST E&I boring location was then interpolated from the groundwater elevation contours. Based on the above information, a minimum excavation elevation and the maximum excavation depth was calculated for each boring location and then used in the base layout design to verify that the maximum depths of excavation recommended were not exceeded. The landfill excavation layout is shown on Drawing No. 2. The basal heave calculations are presented in Attachment D.3.

6.2.2. Slope Stability

Preliminary slope stability analyses were performed to determine the allowable height that will satisfy the requirement of a minimum acceptable factor of safety of 1.5 for both short-term and long-term conditions. The analyses were performed using the computer program PCSTABL5M, developed at Purdue University, to determine the factor of safety for circular and block-type failures for the short-term case, and for circular failures for the long-term case.

The assumption at the start of the analysis was that the short-term case would eventually dictate the design parameters because of the long-term increase in strength that the foundation would experience due to the gradual dissipation of pore water pressure. Pore water pressure dissipation is associated with the consolidation of the foundation soils caused by the added waste load.

Consequently, and through preliminary slope stability analyses performed for various final landfill configurations, the maximum allowable height, satisfying a minimum factor of safety of 1.5 for the short-term case (based on the preliminary analyses), was determined to be at approximately elevation 200 feet NGVD. After selecting the maximum landfill height and slopes, hundreds of trial failure surfaces were generated to verify the slope stability. A generalized cross section of the closed landfill model showing the most critical failure surface is presented on Figure 10 for the short-term analysis. This figure also contains a table summarizing the short-term soil strength properties used in the model. A minimum factor of safety of 1.75 was calculated for the short-term case. The failure surface for the short-term condition was then calculated manually using Bishop's Simplified Method of Slices; these calculations are presented in Attachment D.4. The parameters used for each layer in the model are discussed below (from top to bottom).

Final Cover: The final cover layers include a vegetative soil cover, a geocomposite layer, a 60-mil HDPE textured liner, and a 2-foot compacted cohesive cover. At the discretion of the owner/operator, a 40-mil FML or HDPE may be utilized in lieu of the 60-mil HDPE liner. The sides slopes do not include the HDPE liner. The vegetative cover was assigned a relatively low undrained shear strength of 250 pounds per square foot (psf). The wet unit weight of 100 pounds per cubic foot (pcf) and saturated unit weight of 105 pcf assigned to this layer are typical for a silty or clayey loam. The compacted soil cover was assigned an undrained shear strength of 1,000 psf and a wet density of 110 pcf. The interface friction angles between the geosynthetic materials (geocomposite and HDPE liner) were not included in the model for the cover since the HDPE liner is textured. The interfaces of textured liner and other material (liner/geocomposite, liner/clay) are not expected to be critical because the interface friction angle exceeds 20 degrees.

Waste: Since 1988, a significant amount of research has been conducted on the subject of slope stability modeling techniques for waste fills. Based on studies conducted by Gregory and Wilken (Reference 9) and EMCON Associates (Reference 10), an undrained shear strength of 300 psf and an internal friction angle of 23 degrees are considered appropriate strength properties for solid waste. These values were therefore assigned to the waste in the short-term analysis. These previous studies also reported that the average density of solid waste is between 55 and 60 pcf. A unit weight of 65 pcf was used in the model to account for the industrial waste to be disposed of at the landfill (stabilized non-hazardous sludges, contaminated soils).

Liner System:The liner system is included in the slope stability model as layers 4 through 7 and includes the leachate collection system (LCS) sand, the geotextile/HDPE liner interface, the HDPE liner/clay liner interface, and the compacted clay liner. The angle of internal friction assigned to the LCS sand layer was 35 degrees, which is typical according to Bowles (Reference 11) based on the gradation specified. The interface friction angles of 8 and 10 degrees assigned for layers 5 and 6, respectively were obtained from published information (Reference 12). The geotextile/HDPE liner interface and the HDPE liner/clay liner interface layers have been found to be critical to the stability of waste fills in several landfills analyzed by RUST E&I in recent years. The clay liner was assigned an undrained shear strength of 1,000 psf and a wet density of 110 pcf, which are consistent with previous values obtained during liner construction at other sites.

Native Soils: Four soil strata underlying the landfill were identified in the geotechnical investigations. These layers consist of: 1) highly plastic clays (CH) to medium plastic silty clays (CL); 2) loose to dense silty sand (SM) to sandy silt (ML); 3) dense to very dense sand (SP); and, 4) soft unweathered to weathered Shale (noncemented) rock. The clay layer was assigned a short-term strength of 500 psf and a saturated unit weight of 120 pcf. The two sand layers were assigned angles of internal friction of 25 and 30 degrees, respectively, and saturated unit weights of 115 and 120 pcf, respectively. The shale layer was assigned a short-term strength of 2,500 psf with an angle of friction of 18 degrees, and a saturated unit weight of 140 pcf.

The same landfill configuration was analyzed using the estimated long-term (consolidated-drained condition) strength parameters for the various layers. A generalized cross section of the closed landfill model showing the most critical failure surface is presented in Figure 11 for the long-term analysis. This figure also contains a table summarizing the long-term soil strength properties used in the model. A minimum factor of safety of 1.90 was calculated for the long-term case. The most critical surface generated by the computer model was then calculated manually using Bishop's Simplified Method of Slices. The slope stability calculations including the output file generated by PCSTABL5M are presented in Attachment D.4.

6.2.3 Bearing Capacity Analysis

A bearing capacity analysis was performed to determine the factor of safety against a bearing type failure of the underlying foundation soils due to the added waste load. A factor of safety of 2.2 was calculated against a bearing type failure occurring near the levee. However, it is recommended that the refuse not be placed vertically above elevation 125 feet NGVD. Instead, the refuse should be placed in 10- to 20-foot uniform lifts above elevation 125 feet NGVD. A tier-type construction sequence is also recommended provided that the height on each tier does not exceed 20 feet for every 40 feet of width. The bearing capacity calculations, including all the assumptions and the strength data used in the analysis, are presented in Attachment D.5.

6.2.4 Consolidation and Settlement

A consolidation analysis was performed to determine the ultimate settlement that the foundation will undergo as a result of the load imposed by the added refuse. The analysis was performed using the computer program SETOFF, developed by Ensoft Inc., of Austin, Texas. The program is capable of calculating the settlement of soils under areal loads. The closed landfill configuration was divided into nine load areas (with a maximum areal load of 8,000 psf) and 174 locations throughout the landfill were input into the program as settlement points. A settlement contour map was then generated using the computer program SURFER. The settlements, as calculated by SETOFF, ranged from 0 inch at the outer limits of the load areas to 39 inches under the maximum loads of the landfill. The computer analysis was then manually calculated for the highest settlement value using Terzaghi's one-dimensional consolidation theory, yielding a value of 38.5 inches, thus verifying the accuracy of the assumptions used in the computer model.

The analysis also showed that the difference in the elevation of the top of the clay liner between the center and the southern edge of the landfill will change as a result of the anticipated settlement. The elevation of the landfill base at the center of the landfill will be reduced by 3 feet. However, this loss in elevation is gradual over a distance of approximately 1,000 feet and, therefore, the gradient on the base of the landfill, including leachate collection pipes and liner, will still be adequate.

The settlement calculations including the computer model, the load areas and the coordinates of the settlement points used in the model, the output file generated by SETOFF, the settlement contour map generated by SURFER, and the hand calculations are presented in Attachment D.6.

Settlement calculations were also performed to evaluate the amount of settlement that would have to occur within the refuse to cause failure of the 60-mil geomembrane due to strain. This settlement was calculated for the refuse over a twenty-year period using the closed landfill configuration. According to the calculations, a differential settlement of 6.75 feet would have to occur over a length of 14.85 feet in order for the geomembrane to fail due to elongation, a condition that is unlikely to occur.

6.2.5 Effect of Differential Settlement on the Geomembrane

The settlement analysis performed as part of the geotechnical analyses pertinent to the design of the landfill yielded a differential settlement of three feet over the shortest lateral distance at the landfill (1000 feet). This corresponds to a strain of 0.3 percent, which is significantly less than the 10 percent strain limit that could result in failure of the 60 mil HDPE liner. Therefore, the factor of safety against failure of the synthetic liner is approximately 3.3.

6.2.6 Perforated PVC Pipe

The maximum anticipated deflection of the leachate collection system pipe due to the loads imposed by the waste overburden was analyzed using Spangler's Equation. The pipes which were analyzed include the six-inch diameter, Schedule 80 PVC perforated collection lines that are located in trenches along the floor of the landfill and the base of the upslope riser pipes (18-inch diameter SDR 11 HDPE pipe). The results of the calculations indicated an estimated deflection of approximately 3.4 percent for the six-inch diameter collection lines and a deflection of 0.8 percent for the 18-inch HDPE riser pipes, under maximum loading conditions. These deflections are within the maximum allowable cross-sectional deflection of 5%, as stated in the American Water Works Association (AWWA) C900-89. A 5% deflection is also considered to provide a conservative factor of safety against structural failure in accordance with ASTM D-3034.

6.2.7 Surface Water Runoff and Erosion Control

The Soil Conservation Service method (U.S. Department of Agriculture, SCS TR-55, 1986) for computing unit peak discharge was used to evaluate the anticipated runoff from the closure cover during a 25-year, 24-hour storm event for Monroe, Louisiana. The peak discharge computed from these calculations was then used to size surface water collection ditches that will be constructed around the perimeter of the landfill. The assumed flow direction is indicated in the calculations. For this calculation, it was assumed that the flow around the west side of the landfill would discharge at the existing permitted discharge outfall (001) near the sedimentation pond. The surface water runoff calculations are presented in Attachment D.10.

Soil loss from the closure cover was evaluated using the Universal Soil Loss Equation. The results of these calculations are presented in Attachment D.11. As is evident from these calculations, the combined soil loss from the upper and lower slopes of the cover is greater than 5 tons/acre/year. Therefore, erosion control berms have been designed for the upper slope to divert runoff from the upper slope to a chute designed with erosion-control materials. Calculations for the sizing of the runoff control berms and chutes are also presented in Attachment D.11.

7.0 CONSTRUCTION AND OPERATIONS RECOMMENDATIONS

Based on the results of the analyses presented in earlier sections of this report, certain construction and operations recommendations are appropriate. These recommendations are presented below.

7.1 CONSTRUCTION RECOMMENDATIONS

During construction of the clay liner, care should be taken to achieve proper tie-in to existing clay liner in adjacent cell(s). This can be accomplished through benching of the existing liner. In addition, care should be taken to anchor all edges of liner systems that are installed over existing waste cells. At this time, the slope of the liner system installed over these areas is unknown, and will depend on the amount of waste placed in Cells 8 through 11 prior to February 1, 1996 (after this date, waste may only be disposed of in cells designed in accordance with the revised regulations). However, it is recommended that these slopes not exceed 25 percent (4 horizontal to 1 vertical). During construction of the closure cover, the runoff control berms specified for the upper slopes should be constructed only after the cover has progressed to beyond a chute location, so that the corresponding chute may be constructed at the same time as the runoff control berm.

7.2 OPERATIONS RECOMMENDATIONS

Waste placement at the working face should proceed in accordance with previous recommendations for waste lift dimensions. WML must recognize that the most critical landfill slope failure occurs as a block or wedge of waste that separates and slides along the landfill base. This type of failure plane usually occurs as sliding between geosynthetic material with low interface friction angles, such as HDPE liner/drainage net (approximately 8° friction angle), or HDPE/geotextile (10° to 12° friction angle). If waste placement occurs at an approximately 3 horizontal to 1 vertical slope, the probability of a wedge failure increases with height. However, if the waste is tiered or benched after reaching each 20-foot increment in height, the working face should remain stable (See Figure No. 12).

Material used for daily cover should contain sufficient silts and sands so that the material is of moderate permeability. This material would be classified as a ML, SM, or SP material in accordance with the Unified Soil Classified System. These soil types would provide a better trafficibility than the clays and are less likely to clog the leachate collection system, and allow for easier migration of landfill gas.

All referenced tables, figures, attachments, and design drawings are attached and complete this report.

Rust Environment and Infrastructure, Inc.

TABLES

TABLE 1 - SUMMARY OF [illegible]TECHNICAL RESULTS

BORING NUMBER (GRND ELEV. NGVD)	DEPTH (FEET)	USCS	MOIST. CONT. (%)	WET DENSITY (PCF)	DRY DENSITY (PCF)	LIQUID LIMIT %	PLASTICITY INDEX	- 200 SIEVE (%)	Kv (cm/sec)	Kh (cm/sec)	COMPRESS. STRENGTH (TSF)
R-2	4-6	CH	37	115	84	74	40				0.91s
(62.0)	14-16	CL	24	124	100	33	13				0.91
	20-22	CL	26			29	10	70.8			
	32-34	SP-SM	22					9.0			
	46-48	SP-SM	19				NP	6.6			
R-4	8-10	CH	32	117	89	76	49				1.98s
(65.1)	18-20	ML	27			27	3				
	28-30	SP-SM	19					7.2			
	38-40	SP	20					4.6			
R-5	6-8	CH	40	113	81	79	49				0.78s
(61.8)	22-24	CL	27	124	98	38	22				0.56
R-6	8-10	ML	24			26	2				
(62.2)	20-22	CH	26	123	98	53	30				1.26s
	34-36	SP	21					2.7			
	48-50	SP	16					3.1			
R-7	6-8	CH	40	116	83	77	49				1.46s
(62.7)	16-18	CL	30	130	100	27	8				0.69
R-8	4-6	CH	42	112	79	86	56				1.16s
(64.1)	18-20	CL				33	14				
R-9	8-10	ML	24			26	3	70.5			
(54.3)	16-18	CL	26	123	98	39	20				0.63
	24-26	SP-SM						7.7			
	34-36	SP						2.2			
	44-46	SP						1.9			
	73-75	SHALE				77	48		4.7E-09		
R-10	6-8	CH	29	125	97	53	31				1.33
(54.2)	10-12	CL				30	12				
R-11	12-14	CH	44	112	78	97	64				1.24
(61.2)	22-24	CH	38	116	84						0.89
	32-34	CH	47	110	75	93	59				0.87
	36-38	SP-SM						8.6			
	46-48	SP						3.2			

TABLE 1 - SUMMARY OF C[illegible]ECHNICAL RESULTS
(Cont.)

BORING NUMBER (ELEVATION, FT)	DEPTH (FEET)	USCS	MOIST. CONT. (%)	WET DENSITY (PCF)	DRY DENSITY (PCF)	LIQUID LIMIT %	PLASTICITY INDEX	- 200 SIEVE (%)	Kv cm/sec	Kh cm/sec	COMPRESS. STRENGTH (TSF)
R-12	16-18	CL	25	126	101	33	15				0.42
(63.5)	30-32	CL				30	14				
R-13	6-8	CH	39	114	82						1.25s
(63.4)	24-26	CL	28	123	96	32	15				0.46
	26-28	CL	23	123	100	32	15				0.69
	28-30	CL	26	124	98				3.4E-07	4.9E-07	
	30-32	CL	26	119	95						
R-14	20-22	SM	22			24	5	47.1			
(63.5)	22-24	SC	24					41.7			
	32-34	ML	30			24	7	57.3			
R-17	2-4	CH	38	116	84	75	47				2.34s
(62.8)	22-24	CL	21			27	11				
	32-34	SP-SM	21				NP	11.6			
	42-44	SP-SM	21					11.0			
R-19	14-16	CH	56	106	68	103	69				0.79s
(60.1)	16-18	CH	64	99	60.5	103	69		2.5E-08	1.5E-08	
	26-28	CH	45	107	74	79	40				0.65
	36-38	SP	23					2.6			
	48-50	SP	21					3.8			
R-20	8-10	CH	37	115	84	92	60				1.21s
(63.2)	18-20	ML	32	115	87	26	3				0.53TX
R-21	8-10	CL	27	123	97	42	23				0.66
(58.0)	12-14	ML	24					66.9			
	24-26	ML	24			25	4				
	32-34	SP	22					2.8			
	46-48	SP	12					3.2			
R-22	4-6	CL	25	125	100	36	19				1.40
(55.0)	10-12	CL				28	8				
R-23	4-6	CH	40	112	80	92	56				1.16s
(62.2)	14-16	CH	25	126	101	67	48	97.4	2.9E-08		•
	28-30	CL	23	129	105	44	23				2.36
	34-36	SP	20					3.1			
	44-46	SP-SM	17					6.5			

TABLE 1 - SUMMARY OF [illegible]TECHNICAL RESULTS (Cont.)

BORING NUMBER (ELEVATION, FT)	DEPTH (FEET)	USCS	MOIST. CONT. (%)	WET DENSITY (PCF)	DRY DENSITY (PCF)	LIQUID LIMIT %	PLASTICITY INDEX	- 200 SIEVE (%)	Kv cm/sec	Kh cm/sec	COMPRESS. STRENGTH (TSF)
R-25	6-8	CH	41	115.62	82	74	45				1.07s
(64.7)	24-26	CL	28	124	97	28	13				
R-27	6-8	CH	32	116	88	87	54				2.10s
(62.9)	12-14	CH	46	117	80	105	74				1.54
	22-24	CL	32			39	21				
	28-30	SP						4.3			
	38-40	SP						2.0			
	48-50	SP						3.7			
R-29	6-8	CH	37	114	83	90	60				1.28s
(64.9)	18-20	SM	23				NP	88.3			
	24-26	ML	22			25	3	80.9			
	32-34	SP-SM	22					5.7			
	46-48	SP	18					4.4			
R-30	6-8	CH	33	116	87	89	56				2.21s
(61.6)	16-18	ML				24	4				
R-31	8-10	CH	45	112	77	88	58				1.22s
(60.5)	20-22	CH	26	121	96	59	36				1.62
	28-30	SM	25					33.2			
	34-36	SP	26					4.4			
	48-50	SP	19					3.1			
R-32	22-24	SM	22					40.3			
(61.5)	38-40	SP	21					4.0			
R-33	10-12	CL	25	128	102	43	22				1.49
(61.6)	18-20	ML	21				NP	67.8			
	26-28	SP-SM	21					6.7			
	44-46	SP	21					4.9			
	53-55	SP-SM	22					10.8			
	63-65	GP-GW	12					5.2			
	73-75	MH				60	26				
R-34	22-24	ML	22					76.1			
(61.5)	24-26	ML				23	2				
	28-30	ML	26			22	3	69.9			

TABLE 1 - SUMMARY OF [illegible]TECHNICAL RESULTS
(Cont.)

BORING NUMBER (ELEVATION, FT)	DEPTH (FEET)	USCS	MOIST. CONT. (%)	WET DENSITY (PCF)	DRY DENSITY (PCF)	LIQUID LIMIT %	PLASTICITY INDEX	- 200 SIEVE (%)	Kv cm/sec	Kh cm/sec	COMPRESS. STRENGTH (TSF)
R-34 (61.5)	30-32	SM	19					16.2			
R-35	10-12	CH	46	110	75	92	60				
63.4	12-14	CH	42	108	76				2.4E-09	8.6E-09	
	34-36	CL	31	118	90	24	7				
R-36	8-10	CH	33	136	102	77	47				1.84s
(61.8)	14-16	CH	38	126	91	54	35				1.06s
	18-20	CL	29			30	9				
	24-26	ML	28					73.3			
	32-34	SP-SM	22					9.4			
	53-55	SP	22					4.6			
	68-70	SP-SM	22					6.9			
R-37	8-10	CH	35	116	86	95	63				1.05s
(62.6)	16-18	SP-SM					NP				
	24-26	SM						20.6			
	28-30	CL				29	8				
	30-32	SP-SM						9.8			
	38-40	SP						3.2			
	48-50	SP						1.7			
R-39	4-6	CH	36	116	85	90	62				1.32s
(64.1)	14-16	CH	32	120	91	72	46				1.38s
	24-26	SP-SM	23					9.0			
	38-40	SP	22					3.1			
R-41	10-12	CH	26	126	100	55	35				1.17
(62.5)	18-20	SM	25					28.2			
	34-36	SP-SM	21					5.3			

<u>Notes:</u>

s = Slickednslides Failures
Tx = Triaxial Unconsolidated-Undrained Test - Confining Pressure = 10 psi

TABLE 2
HISTORICAL GROUNDWATER ELEVATIONS
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA

	MONITOR WELLS (SCREENED INTERVAL -FT NGVD)								
Date Measured	MW-01 (28.65-23.65)	MW-02 (20.75-15.75)	MW-03 (33.85-28.85)	MW-04 (25.95-20.95)	MW-05 (20.25-15.25)	MW-06 (38.50-33.50)	MW-07 (33.30-28.30)	MW-08 (23.40-18.40)	MW-09 (28.40-23.40)
02/25/86	52.30	51.75	50.90	50.40	50.30	49.60	49.60	50.80	50.80
10/04/86	50.63	50.17	50.48	57.57	50.67	51.03	48.75	48.80	52.68
04/09/87	55.30	54.60	53.40	52.60	52.80	52.20	52.10	53.50	54.20
11/19/87	50.20	50.00	49.60	48.50	48.70	48.00	47.70	48.70	47.40
04/01/88	53.50	53.10	52.00	51.10	51.40	50.80	50.60	52.00	52.60
04/29/88	54.20	53.90	52.45	51.00	51.65	51.45	51.45	52.65	53.35
10/13/88	49.40	49.00	48.50	46.50	47.70	47.00	46.90	47.90	48.40
04/20/89	53.60	53.00	51.90	50.90	51.20	50.50	50.40	51.70	52.40
10/10/89	50.80	51.40	50.70	49.70	49.90	49.20	49.00	49.10	50.80
04/11/90	55.20	54.70	53.40	52.40	52.60	51.90	51.80	53.30	54.10
10/04/90	50.60	50.30	49.60	48.50	48.70	48.00	47.70	48.90	49.50
04/23/91	55.00	54.40	53.30	52.20	52.40	51.60	51.40	52.90	53.60
11/12/91	53.20	52.70	52.00	51.00	51.20	500.70	50.60	51.70	52.20
04/22/92	55.28	54.76	53.76	50.90	53.26	52.72	52.64	53.80	54.26
12/08/92	51.90	51.50	50.70	49.70	50.10	49.40	49.20	50.30	50.80
04/07/93	55.00	54.40	52.80	51.80	52.20	51.50	51.80	53.60	53.40
10/06/93	51.08	50.72	50.12	49.09	50.39	48.61	48.23	49.34	49.91
04/07/94	52.76	52.28	51.56	50.58	50.97	50.39	50.17	51.16	51.68
10/05/94	51.01	50.58	50.05	49.02	49.42	48.63	48.43	49.37	49.87
04/13/95	53.91	53.39	52.55	51.53	51.97	51.35	51.20	52.25	52.84
11/27/95	49.98	49.55	48.97	48.01	48.49	47.49	47.30	48.31	48.82
02/12/96	*49.68*	*49.45*	*48.55*	*48.17*	*47.78*	*47.49*	*47.14*	*48.04*	*48.06*
02/27/96	*49.26*	*49.52*	*48.59*	*48.27*	*47.91*	*47.62*	*47.24*	*48.14*	*48.68*
06/25/96	*50.10*	*49.94*	*49.18*	*48.76*	*48.26*	*47.95*	*47.59*	*48.53*	*49.07*
	PIEZOMETERS								
Date Measured	P-01	P-02	P-03	PZ-10 *	PZ-11 *	PZ-12 *	PZ-14 *	PZ-15 *	P-16 *
08/05/93	53.04	52.30	52.92	NA	NA	NA	NA	NA	NA
09/08/93	52.10	51.34	52.02	NA	NA	NA	NA	NA	NA
02/12/96	50.62	49.59	50.34	*48.27*	*47.47*	*47.46*	*48.00*	*48.60*	*49.57*
02/27/96	50.68	49.61	50.39	*48.37*	*47.56*	*47.55*	*48.42*	*48.64*	*49.77*
06/25/96	NA	NA	NA	*48.19*	*47.93*	*47.92*	*48.90*	*49.25*	*50.09*
	PIEZOMETERS								
Date Measured	P-17A #	P-17B #	P-17C #	PZ-17D #	PZ-18A #	PZ-18B #	PZ-18C #	PZ-18D #	
06/25/96	*47.85*	*47.94*	*47.88*	*47.94*	*49.42*	*49.17*	*49.47*	*49.48*	

Notes:
* Piezometers installed in February 1996.
\# Piezometers installed in May 1996.
NA - Not applicable
Monitor wells were resurveyed between May 26 and June 4, 1996 to establish a new TOC elevation.

TABLE 3
PIEZOMETER/MONITOR WELL CONSTRUCTION SUMMARY
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA

Piezometer / Monitor well No.	Installation Date	Total Depth (ft. Below Ground Surface)	Ground Surface Elevation (NGVD)	TOC Elevation (NGVD)	Screen Depth (ft. Below Ground Surface)	Screen Elevation (NGVD)	Top of Filter Pack (Depth/Elev.)	Top of Bentonite (Depth/Elev.)	Top of Fine Sand (Depth/Elev.)	Formation Screened
MW-01	10/85	42.25	63.90	66.19	35.25 - 40.25	28.65 - 23.65	33.80/30.10	29.00/34.90	N/A	stratum III
MW-02	10/85	52.25	63.00	66.02	42.25 - 47.25	20.75 - 15.75	40.50/22.50	37.00/26.00	N/A	stratum III
MW-03	10/85	39.75	63.60	65.89	29.75 - 34.75	33.85 - 28.85	25.00/38.60	19.00/44.60	N/A	stratum III
MW-04	10/85	44.75	60.70	63.51	34.75 - 39.75	25.95 - 20.95	32.00/28.70	29.00/31.70	N/A	stratum III
MW-05	10/85	52.25	62.50	65.13	42.25 - 47.25	20.25 - 15.25	38.00/24.50	35.00/27.50	N/A	stratum III
MW-06	10/85	35.00	63.50	65.97	25.00 - 30.00	38.50 - 33.50	21.00/42.50	17.00/46.50	N/A	stratum III
MW-07	10/85	40.00	63.30	66.15	30.00 - 35.00	33.30 - 28.30	26.00/37.30	22.00/41.30	N/A	stratum III
MW-08	10/85	50.00	63.40	65.39	40.00 - 45.00	23.40 - 18.40	35.00/28.40	32.00/31.40	N/A	stratum III
MW-09	10/85	45.00	63.40	65.50	35.00 - 40.00	28.40 - 23.40	32.00/31.40	29.00/34.40	N/A	stratum III
PZ-10	1/30/96	24.00	63.02	66.34	20.00 - 24.00	43.02 - 39.02	12.00/51.02	8.00/55.02	7.00/56.02	stratum II
PZ-11	1/30/96	18.00	63.17	66.30	13.00 - 18.00	50.17 - 45.17	11.00/52.17	8.00/55.17	7.00/56.17	stratum II
PZ-12	2/6/96	86.00	62.92	65.94	76.00 - 86.00	-13.08 - (-)23.08	74.00/(-)11.08	68.00/(-)5.08	67.00/(-)4.08	stratum III base
PZ-14	1/31/96	26.00	60.15	63.38	21.00 - 26.00	39.15 - 34.15	19.00/41.15	15.00/45.15	14.00/46.15	stratum II
PZ-15	2/5/96	20.00	63.05	66.13	15.00 - 20.00	48.05 - 43.05	13.00/50.05	9.00/54.05	8.00/55.05	stratum II
PZ-16	2/6/96	28.00	63.00	66.39	23.00 - 28.00	40.00 - 35.00	21.00/42.00	17.00/46.00	16.00/47.00	stratum II
PZ-17A*	5/21/96	37.24	63.30	65.07	36.24 - 37.24	27.06 - 26.06	35.0/28.3	30.0/33.3	N/A	stratum III
PZ-17B*	5/21/96	42.84	63.10	64.58	41.84 - 42.84	21.26 - 20.26	41.0/22.1	36.0/27.1	N/A	stratum III
PZ-17C*	5/21/96	53.62	62.90	64.50	52.62 - 53.62	10.28 - 9.28	52.0/10.9	47.0/15.9	N/A	stratum III
PZ-17D*	5/21/96	59.17	62.90	64.44	58.17 - 59.17	4.73 - 3.73	58.0/4.9	53.0/9.9	N/A	stratum III
PZ-18A*	5/22/96	19.53	56.80	58.38	18.53 - 19.53	38.27 - 37.27	18.0/38.8	13.0/43.8	N/A	stratum II
PZ-18B*	5/22/96	35.74	56.80	58.56	34.74 - 35.74	22.06 - 21.06	34.0/22.8	29.0/27.8	N/A	stratum III
PZ-18C*	5/22/96	53.23	56.80	57.78	52.23 - 53.23	4.57 - 3.57	52.0/4.8	47.0/9.8	N/A	stratum III
PZ-18D*	5/22/96	65.29	56.60	58.07	64.29 - 65.29	(-)7.69 - (-)8.69	64.0/(-)7.4	59.0/(-)2.4	N/A	stratum III base
P-1	7/16/93	19.00	64.78	68.11	13.80 - 18.80	50.98 - 45.98	11.60/53.80	8.40/56.38	N/A	stratum I
P-2	7/16/93	15.00	58.20	61.77	8.80 - 13.80	49.40 - 44.40	6.60/46.60	3.40/49.80	N/A	stratum II
P-3	7/16/93	20.00	62.75	66.07	14.80 - 19.80	47.95 - 42.95	12.70/53.37	10.50/55.57	N/A	stratum I

Notes:
All elevations referenced to National Geodetic Vertical Datum (N.G.V.D.)
N/A = not applicable
* - Temporary piezometer

TABLE 4
SUMMARY OF IN-SITU HYDRAULIC CONDUCTIVITY TEST RESULTS
SUPPLEMENTAL HYDROGEOLOGIC INVESTIGATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA

PIEZOMETER NUMBER	ESTIMATED HORIZONTAL HYDRAULIC CONDUCTIVITY (K) (ft/sec)	(ft/day)	(cm/sec)
Stratum II			
P-1-f	5.47E-05	4.726	1.67E-03
P-1-r *	0.00	0.00	0.00
P-2-f	1.78E-05	1.538	5.43E-04
P-2-r	6.28E-07	0.054	1.92E-05
P-3-f	3.86E-06	0.334	1.18E-04
P-3-r	3.27E-06	0.283	9.97E-05
PZ-10-f	9.82E-05	8.483	2.99E-03
PZ-10-r	1.16E-04	10.027	3.54E-03
PZ-14-f	1.91E-06	0.165	5.83E-05
PZ-14-r	2.36E-06	0.203	7.18E-05
PZ-15-f	1.09E-05	0.944	3.33E-04
PZ-15-r	7.79E-05	6.732	2.38E-03
PZ-16-f	7.86E-05	6.794	2.40E-03
PZ-16-r	3.44E-05	2.971	1.05E-03
Average:	**1.42E-05**	**1.223**	**4.32E-04**
Stratum III			
MW-01-f	2.05E-04	17.712	6.25E-03
MW-01-r	1.82E-04	15.725	5.55E-03
MW-04-f	1.08E-04	9.331	3.29E-03
MW-04-r	8.30E-05	7.171	2.53E-03
MW-07-f	1.66E-04	14.342	5.06E-03
MW-07-r	1.97E-04	17.021	6.01E-03
MW-09-f	9.90E-05	8.554	3.02E-03
MW-09-r	9.83E-05	8.493	3.00E-03
PZ-12-f **	4.41E-04	38.088	1.34E-02
PZ-12-r **	4.23E-04	36.562	1.29E-02
Average:	**1.70E-04**	**14.666**	**5.18E-03**

Notes:

(1) Test data were analyzed using the Cooper et al method (1967) for confined aquifers.
r - Rising head test: 02/96
f - Falling head test: 02/96
* - No data.
** - Test data analyzed using the Bouwer - Rice method (1976, 1989) for unconfined aquifers.

TABLE 5
NESTED PIEZOMETERS/WELLS
VERTICAL GRADIENT SUMMARY
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA

Piezometer/Well I.D.	Unit Monitored	Potentiometric Elevation (2/27/96)	▲ h (FT)	i (feet/foot)	Gradient	Potentiometric Elevation (6/25/96)	▲ h (FT)	i (feet/foot)	Gradient
PZ-16 MW-02	Stratum II Stratum III	49.77 49.52	0.25	0.0130	▼	50.09 49.94	0.015	0.008	▼
PZ-15 MW-03	Stratum II Stratum III	48.64 48.59	0.05	0.0035	▼	49.25 49.18	0.07	0.005	▼
PZ-14 MW-04	Stratum II Stratum III	48.42 48.27	0.15	0.0114	▼	48.90 48.76	0.14	0.01	▼
PZ-11 MW-06	Stratum II Stratum III	47.56 47.62	(-)0.06	(-)0.0051	▲	47.93 47.95	(-)0.02	(-)0.002	▲
PZ-10 MW-08	Stratum II Stratum III	48.37 48.14	0.23	0.0111	▼	48.19 48.53	(-)0.34	(-)0.016	▲
PZ-18A PZ-18B	Stratum II Stratum III	NA NA	NA NA	NA NA	—	49.42 49.17	0.25	0.015	▼
PZ-17A PZ-17B	Stratum III Stratum III	NA NA	NA NA	NA NA	—	47.85 47.94	(-)0.09	(-)0.016	▲
PZ-17B PZ-17C	Stratum III Stratum III	NA NA	NA NA	NA NA	—	47.94 47.88	0.06	0.005	▼
PZ-17C PZ-17D	Stratum III Stratum III	NA NA	NA NA	NA NA	—	47.88 47.94	(-)0.06	(-)0.011	▲
PZ-18B PZ-18C	Stratum III Stratum III	NA NA	NA NA	NA NA	—	49.17 49.47	(-)0.3	(-)0.017	▲
MW-06 PZ-12	Stratum III Stratum III (base)	47.55 47.62	(-)0.07	(-)0.0013	▲	47.95 47.92	0.03	0.001	▼
PZ-18C PZ-18D	Stratum III Stratum III (base)	NA NA	NA NA	NA NA	—	49.47 49.48	(-)0.01	(-)0.001	▲

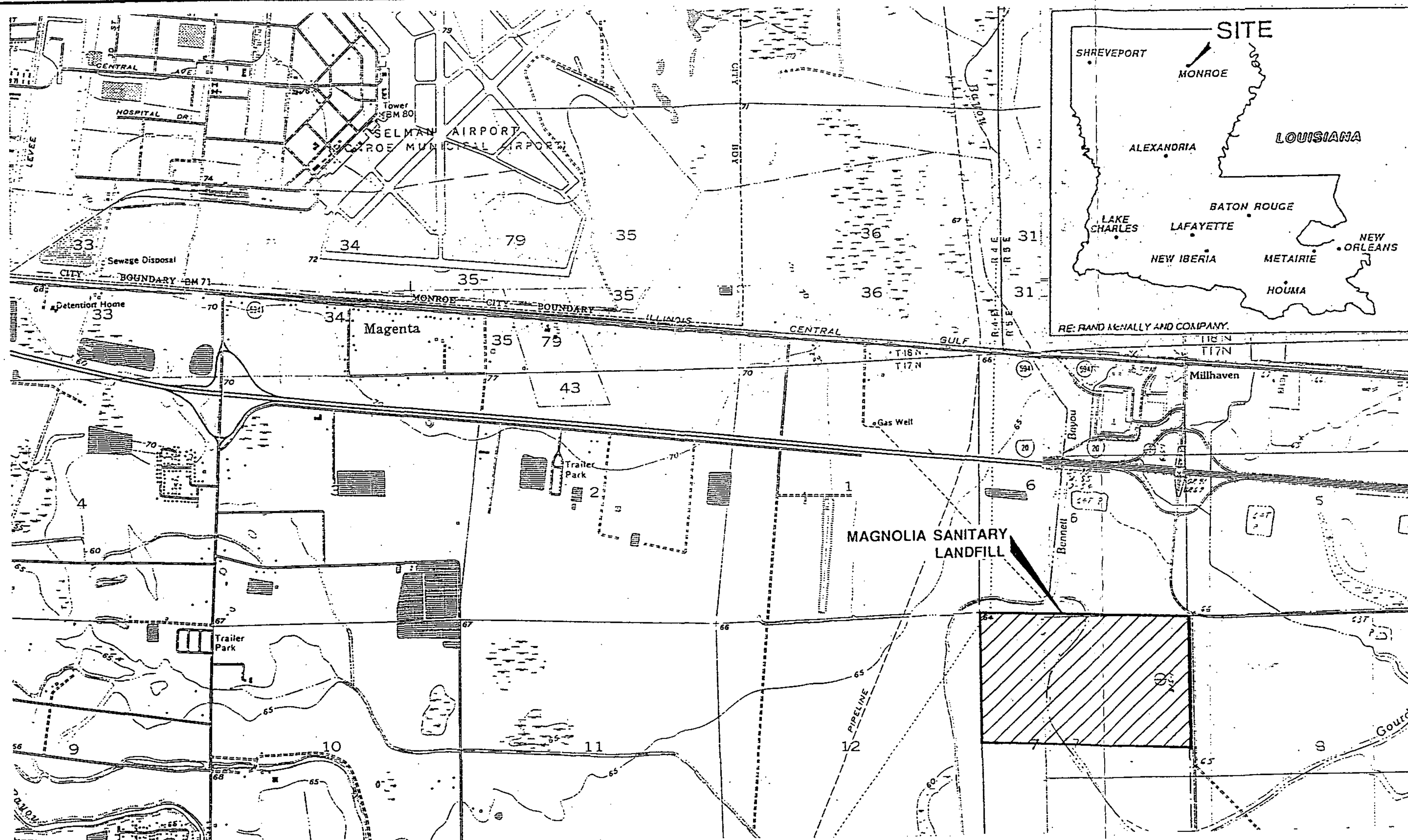
h - Hydrostatic Head Differential (feet)
i - Gradient between nested wells
NA - No Data Available

TABLE 6
SUMMARY OF PROPOSED MONITOR WELL NETWORK
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA

Monitor Well No.	Existing or Proposed Well Location	Site Coordinates		Ground Surface Elevation (NGVD)	Screen Depth (ft. Below Ground Surface)	Screen Length (feet)	Screen Elevation (NGVD)	Formation Screened	Directional Gradient
		Northing	Easting						
Stratum II									
MW-10 (PZ-10)	Existing	3523.2387	4853.2926	63.02	20.0-24.0	4.0	43.02-39.02	Stratum II	Downgradient
MW-15 (PZ-14)	Existing	2630.4835	2179.5625	60.15	21.0-26.0	5.0	39.15-34.15	Stratum II	Downgradient
MW-17 (PZ-15)	Existing	2665.8662	1219.0358	63.05	15.0-20.0	5.0	48.05-43.05	Stratum II	Downgradient
MW-19 (PZ-16)	Existing	4217.0424	637.2235	63.0	23.0-28.0	5.0	40.0-35.0	Stratum II	Upgradient
Stratum II/III									
MW-11	Proposed	2776.5786	4820.8016	64.0*	23.0-33.0*	10.0*	41.0-31.0*	Stratum II/III	Downgradient
MW-12	Proposed	2451.3200	4402.0793	64.0*	23.0-33.0*	10.0*	41.0-31.0*	Stratum II/III	Downgradient
MW-13	Proposed	2525.4776	3596.6657	64.0*	18.0-28.0*	10.0*	46.0-36.0*	Stratum II/III	Downgradient
Stratum III									
MW-1	Existing	5093.2528	1525.9442	63.90	35.25 - 40.25	5.0	28.65-23.65	Stratum III	Upgradient
MW-8	Existing	3530.4794	4841.9648	63.40	40.0-45.0	5.0	23.40-18.40	Stratum III	Downgradient
MW-14	Proposed	2575.1390	2815.6716	64.0*	42.0-52.0*	10.0*	22.0-12.0*	Stratum III	Downgradient
MW-16	Proposed	2618.0633	2011.5487	64.0*	33.0-43.0*	10.0*	31.0-21.0*	Stratum III	Downgradient
MW-18	Proposed	4322.2571	4815.1427	63.0*	40.0-50.0*	10.0*	23.0-13.0*	Stratum III	Downgradient
	Additional piezometers that are not a part of the proposed monitor well network:								
MW-2	Existing	4228.4700	637.0963	63.00	42.25 - 47.25	5.0	20.75-15.75	Stratum III	Upgradient
MW-9	Existing	4461.7009	4820.7397	63.40	35.0-40.0	10.0	28.4-23.4	Stratum III	Downgradient

Notes:
All elevations referenced to National Geodetic Vertical Datum (N.G.V.D.) .
* - Elevations are approximate and will be finalized following well installation.
(PZ-10) - Previous piezometer number

FIGURES



Re: USGS Quadrangle Maps, 7.5 minute series. Monroe North, La. 1975, Monroe South, La. 1975 and Crew Lake, La. 1982.

RUST ENVIRONMENT & INFRASTRUCTURE

DATE	NO.	REVISION	BY

DRAWN BY: J. PARTIN

CHECKED BY / APPROVED BY

DRAWING NO. 86415 V

WASTE MANAGEMENT OF LOUISIANA, INC.

CLIENT

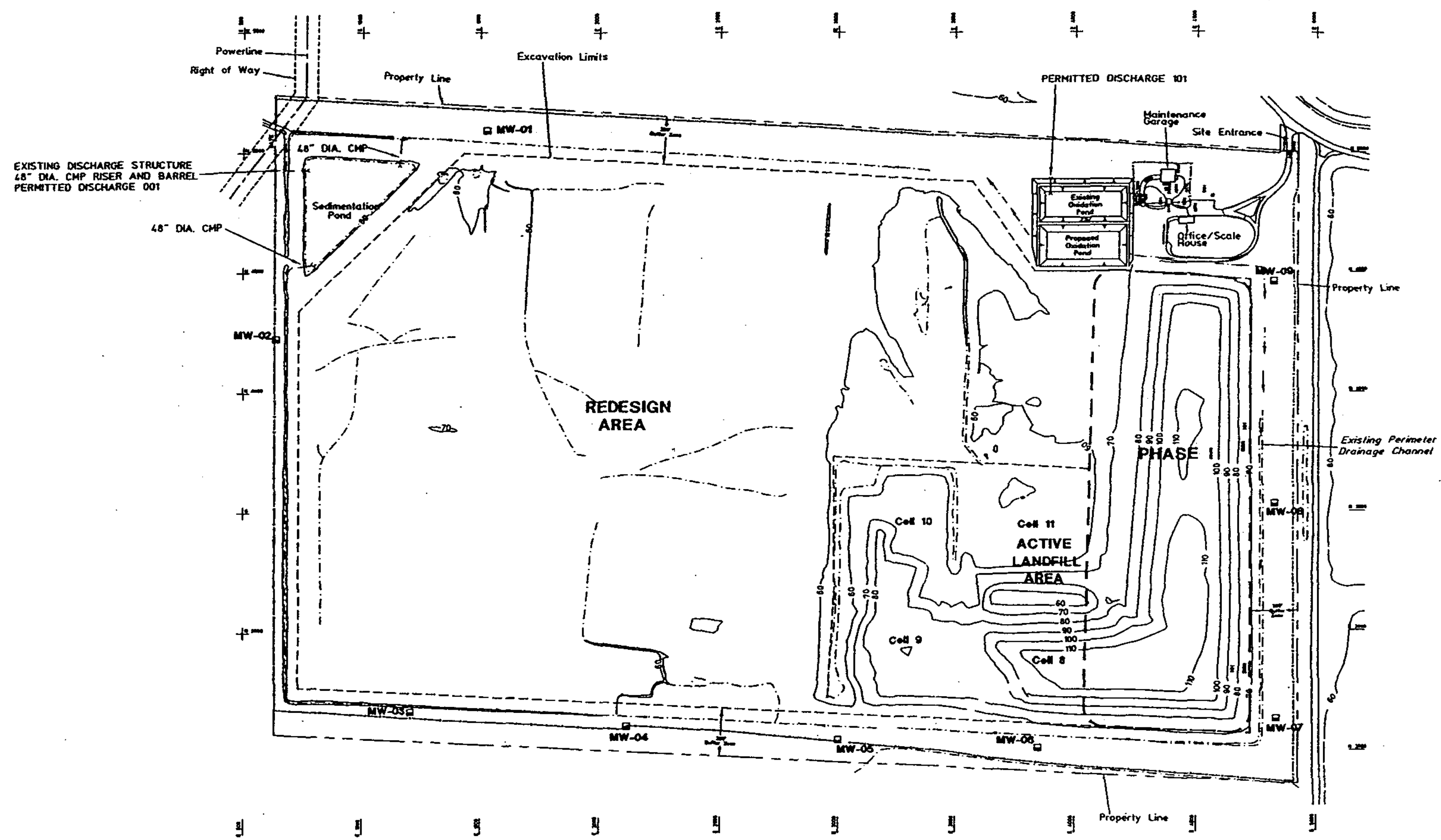
PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA

PROJECT TITLE

VICINITY MAP

1

FIG.NO.



LEGEND

- SURFACE WATER FLOW DIRECTION
- 100 — CONTOUR LINE
- GRID COORDINATE
- PROPERTY BOUNDARY
- EXISTING FENCE
- EXISTING CULVERT
- EXISTING GROUNDWATER MONITOR WELL
- LIMIT OF PHASE I

Re: Permit Installation Report file No. 32711 Dwg. 32711CSP.DWG.

Drawn By: D. ARDIS	1/96	Project No. 32711.100						
Designer: S. REED	1/96	Drawing No. 32711ASP.DWG						
P.E.		Date Issued: 04-03-96						
Approved: M. CALDWELL	1/96	Plot Time: 11:14 a.m.		DATE	NO.	REVISION	BY	

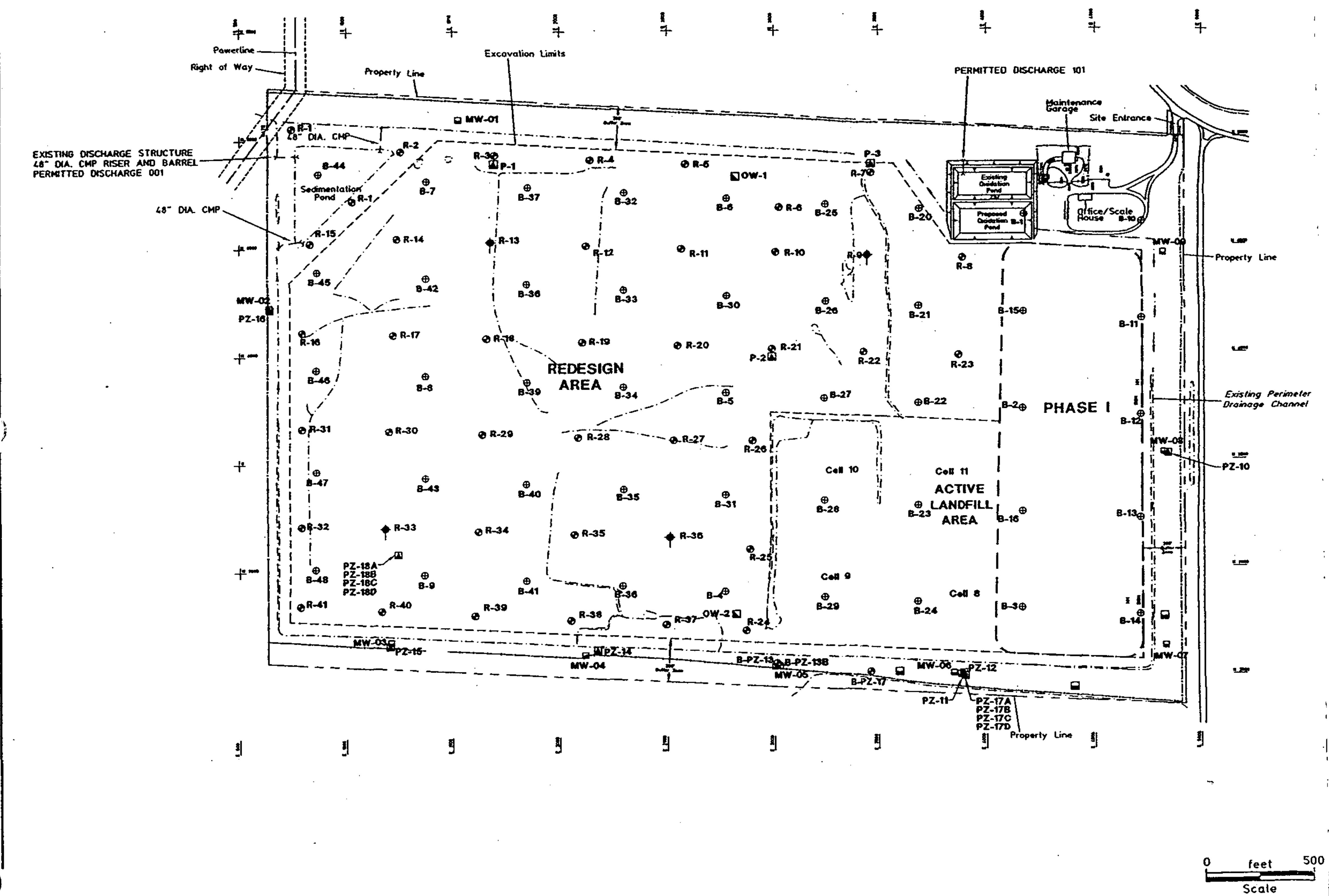
WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

RUST ENVIRONMENT & INFRASTRUCTURE

SITE PLAN

2
FIG. NO.



LEGEND

- LIMIT OF PHASE I
- SURFACE WATER FLOW DIRECTION
- GRID COORDINATE
- PROPERTY BOUNDARY
- EXISTING FENCE
- EXISTING CULVERT
- EXISTING GROUNDWATER MONITORING WELL
- RUST E & I BORING LOCATION
- RUST E & I 100' BORING LOCATION
- SOUTHWEST LABORATORIES, INC. 1984 BORING LOCATION (APPROX.)
- ABANDONED OBSERVATION WELL LOCATION
- RUST E & I PIEZOMETER LOCATION

NOTES:

1. PZ-12 IS A DEEP (86') PIEZOMETER.

Re: Permit Installation Report file No. 32711 Dwg. 32711CSP.DWG.

Drawn By:	D. ARDIS	1/96	Project No.	32711.100
Designer:	S. REED	1/96	Drawing No.	32711ASP.DWG
P.E.			Date Issued:	07-24-96
Approved:	H. CALDWELL	1/96	Plot Time:	3:03 p.m.

DATE	NO.	REVISION	BY

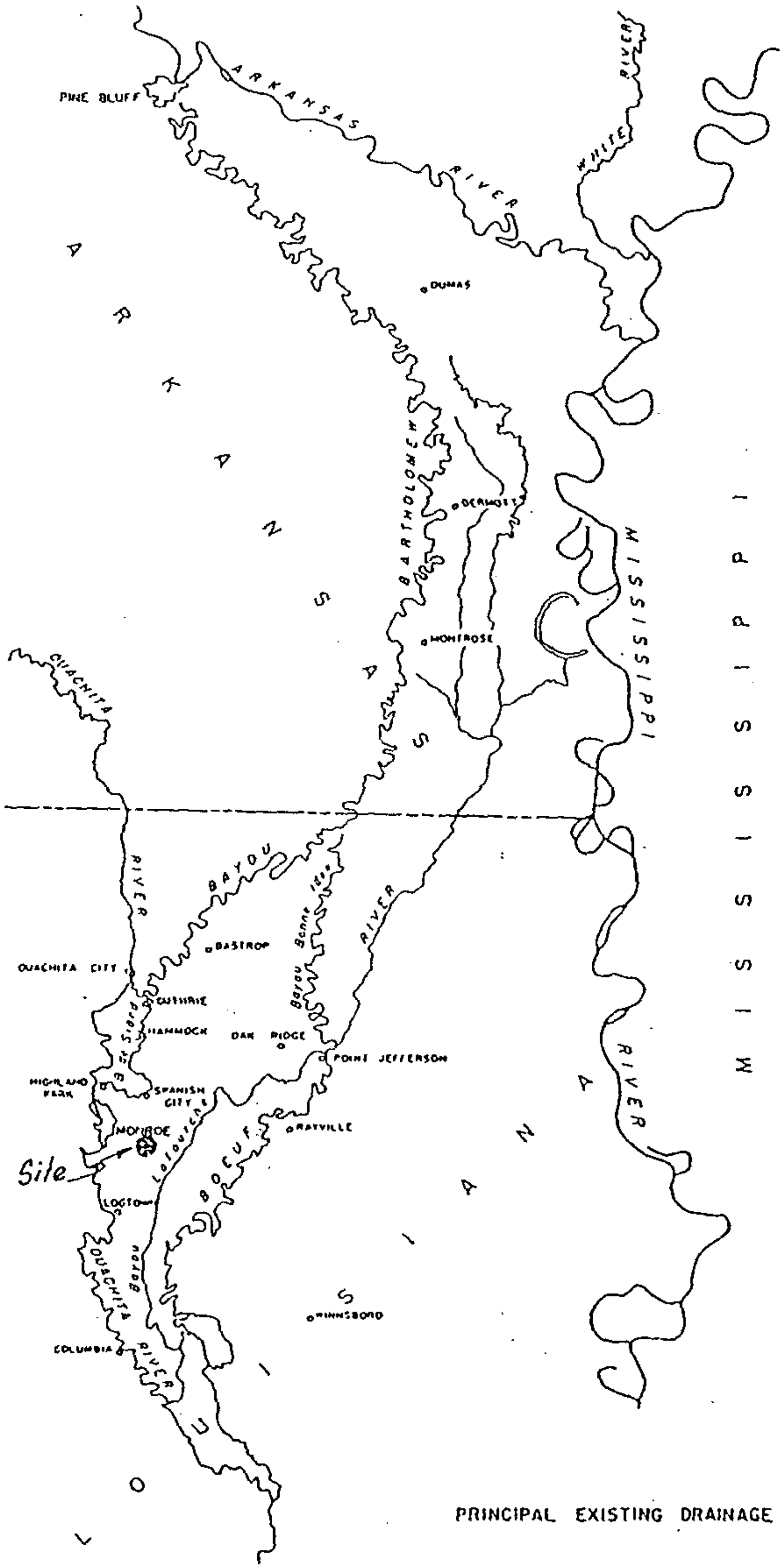
WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

RUST ENVIRONMENT & INFRASTRUCTURE

MONITOR WELL/ PIEZOMETER/
SOIL BORING LOCATION MAP

3
FIG. NO.



PRINCIPAL EXISTING DRAINAGE

0 miles 20
Scale

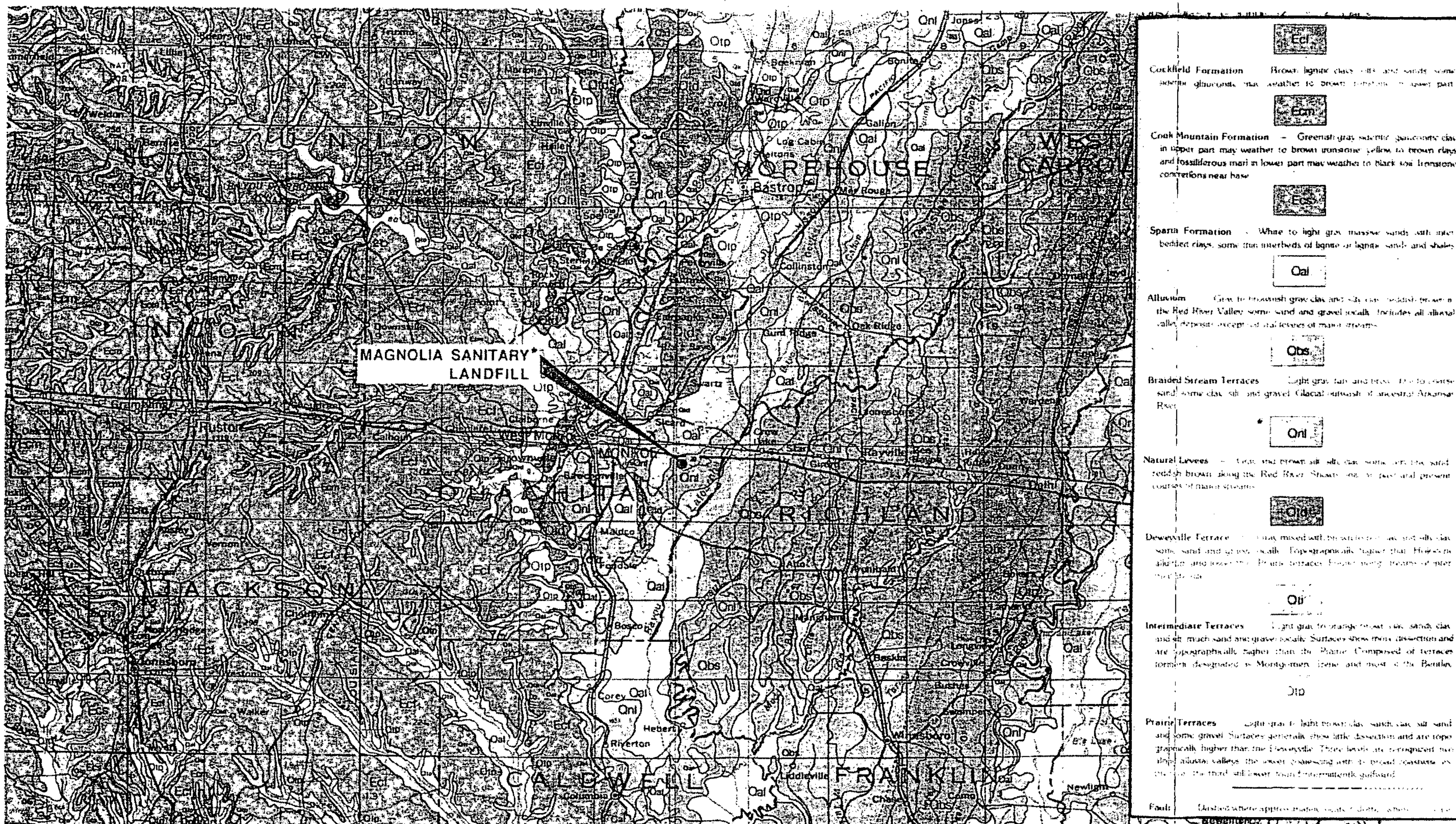
Re: Southwestern Laboratories drawing.

RUST ENVIRONMENT & INFRASTRUCTURE

WASTE MANAGEMENT OF LOUISIANA, INC. Client	PERMIT MODIFICATION MAGNOLIA SANITARY LANDFILL MONROE, LOUISIANA Project Title	REGIONAL DRAINAGE FEATURES	4 Fig. No.

J. PARTIN	Date 10/21/93	Checked By	Revision	Drawing No. 86415	JE

BEST COPY



DRAWN BY J. PARTIN | CHECKED BY | APPROVED BY | DRAWING NO. 86415 GEO.

DATE	NO.	REVISION	BY

WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

PERMIT MODIFICATION MAGNOLIA SANITARY LANDFILL MONROE, LOUISIANA
PROJECT TITLE

RUST ENVIRONMENT & INFRASTRUCTURE

REGIONAL GEOLOGY MAP

5
FIG.NO.

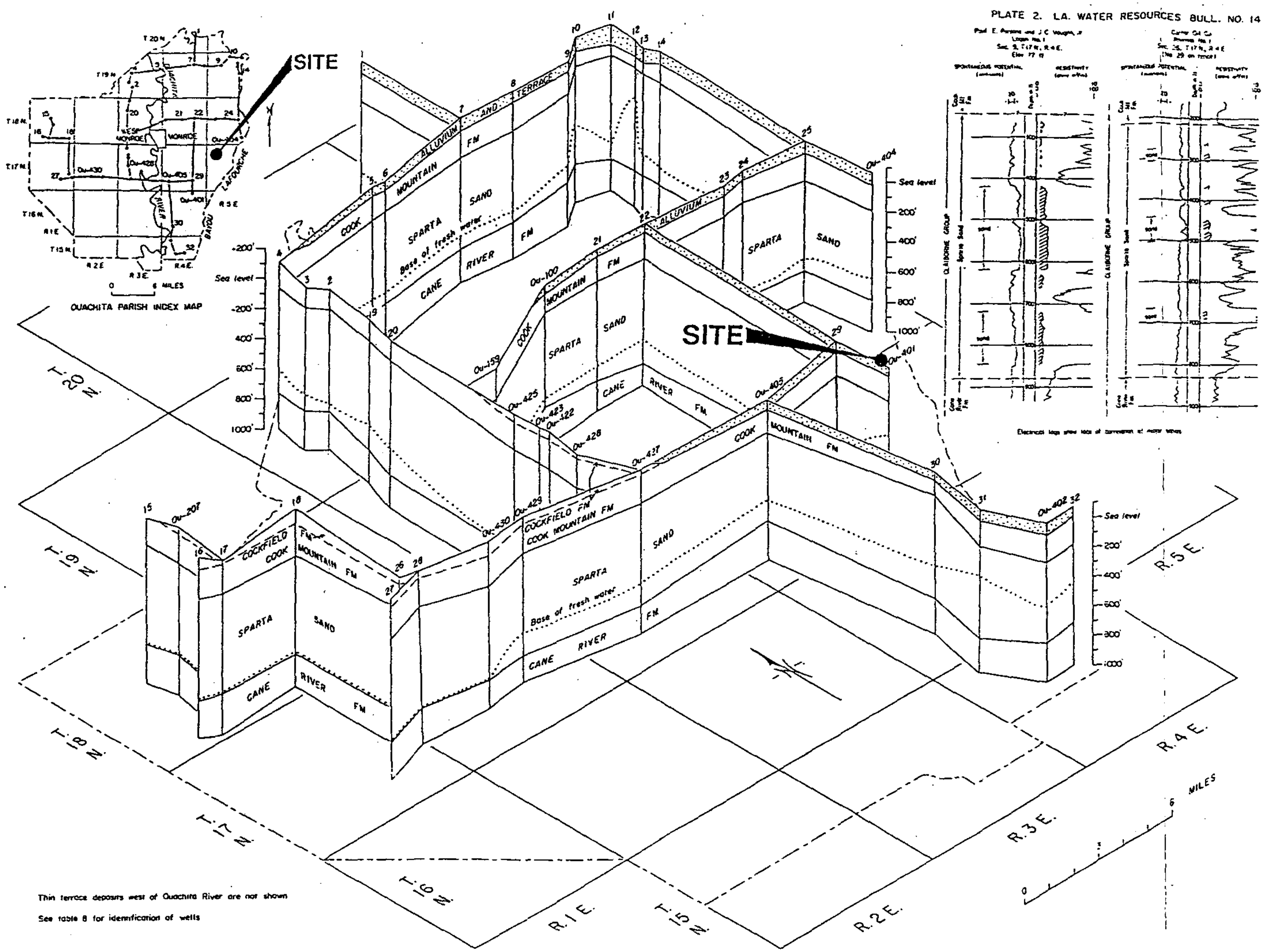


PLATE 2. FENCE DIAGRAM OF OUACHITA PARISH, LOUSIANA.

DRAWN BY: J. PARTIN | CHECKED BY | APPROVED BY | DRAWING NO. 86415 GEO-IS

DATE	NO.	REVISION	BY

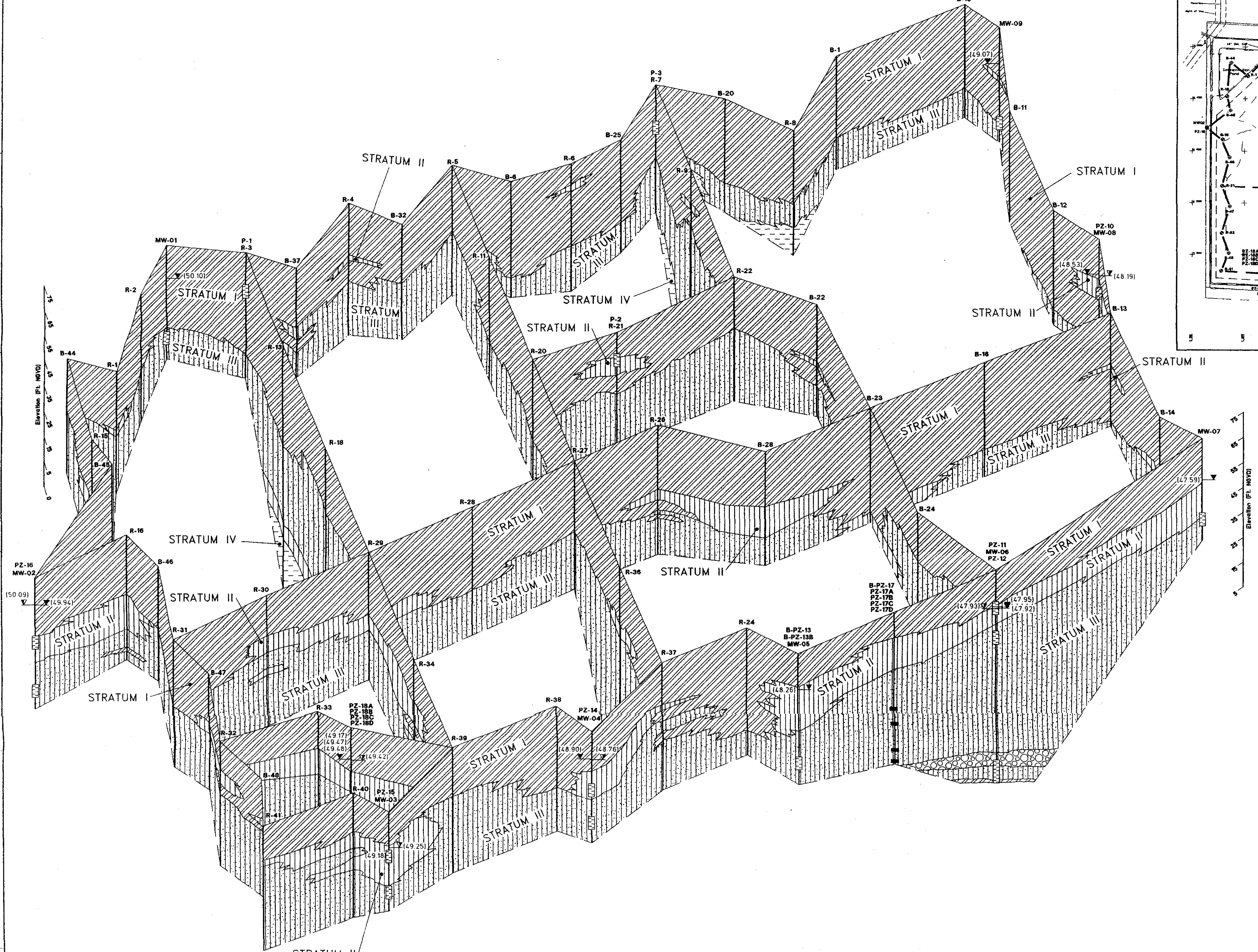
WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

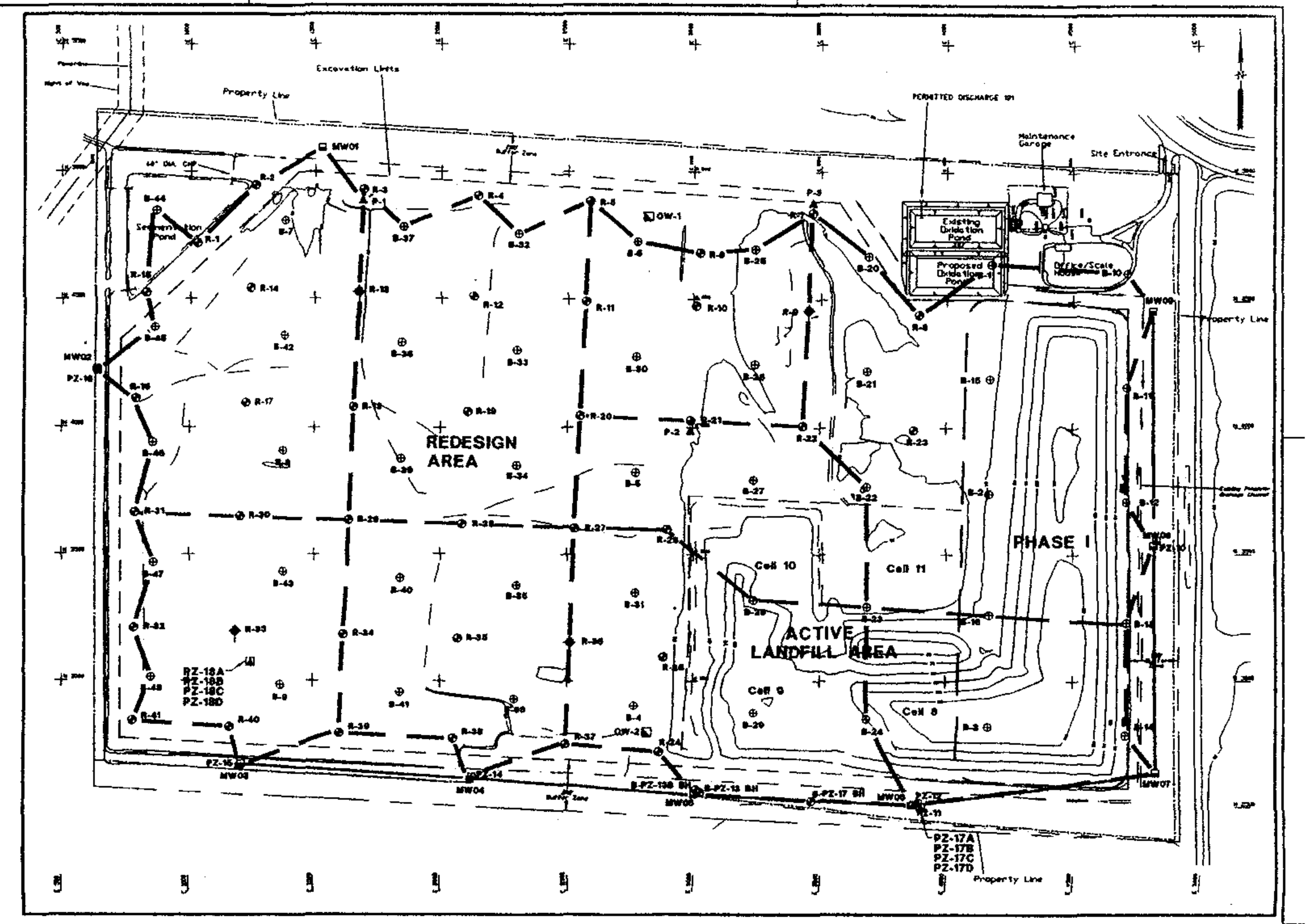
PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

RUST ENVIRONMENT & INFRASTRUCTURE

REGIONAL GEOLOGIC ISOMETRIC PROFILE

6
P.B.NO.





PLAN VIEW

NOT TO SCALE

LEGEND

- INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS (CH) AND INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS (CL)
- INORGANIC SILTS WITH SLIGHT TO NO PLASTICITY SILTY, CLAYEY, SAND OR SILTS (ML)
- SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES (SM) AND POORLY GRADED SANDS, GRAVELLY SANDS (SP)
- CLAY SHALE
- GRAVEL (GP)
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM I (6/25/96)
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM II (6/25/96)
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM III (6/25/96)
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) AT THE BASE OF STRATUM III (6/25/96)

NOTE: SOIL BORINGS (B-1) COMPLETED BY SWL (1984)
SOIL BORINGS (R-1) COMPLETED BY RUST E&I (1994)
SOIL BORINGS (PZ-10) COMPLETED BY RUST E&I (1996)

0 feet 200
Scale
Horizontal Scale: 1" = 200'
Vertical Scale: 1" = 20'

Description		Date	Ini
Drawn By:	PARTIN	3/96	
Designer:	DAT	DATE	
Checked:	CALDWELL	DATE	
P.E.			
Approved:			
Revision:			
Revision:			
Revision:			
Project No.	32711.100		
Drawing No.	32711AIS.DWG		
Date Issued	07-23-96		
Plot Time	9:09 a.m.		

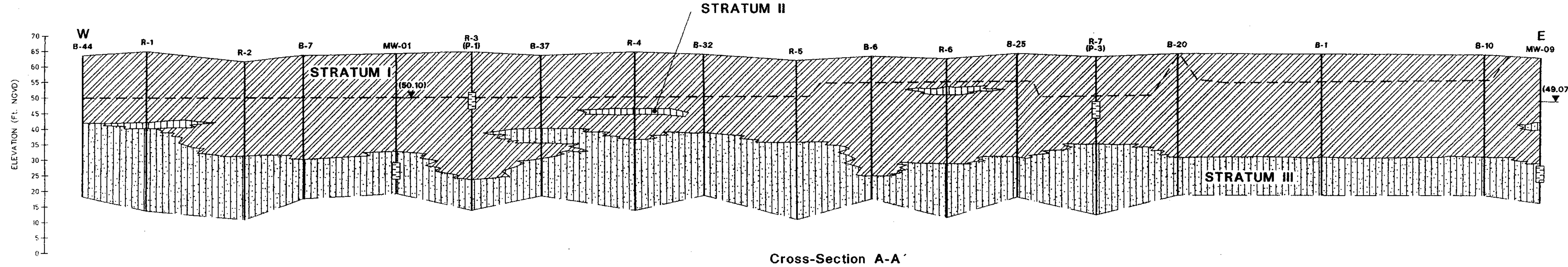
RUST ENVIRONMENT & INFRASTRUCTURE

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

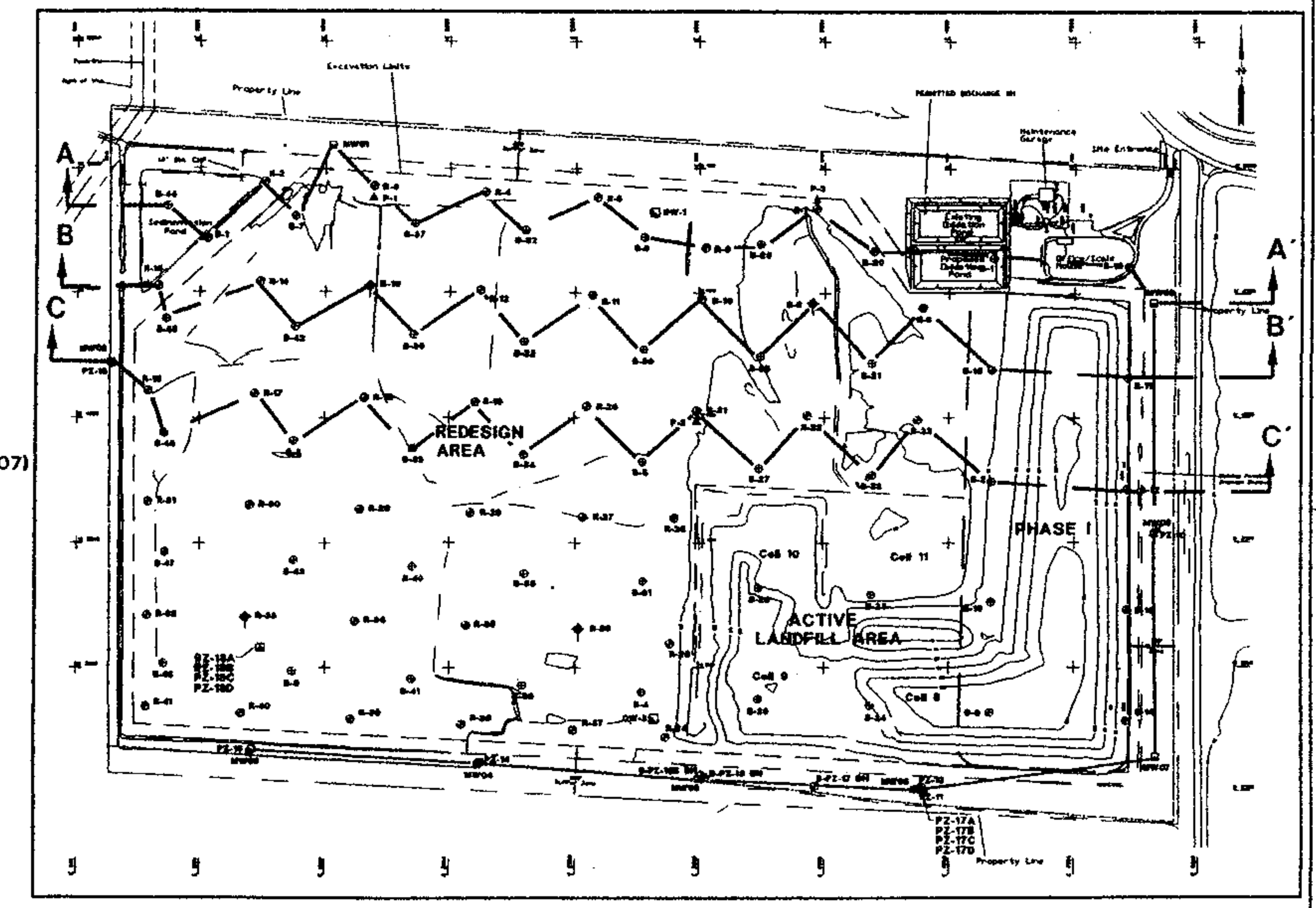
WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

ISOMETRIC SOIL PROFILE

7
FIGURE NO.

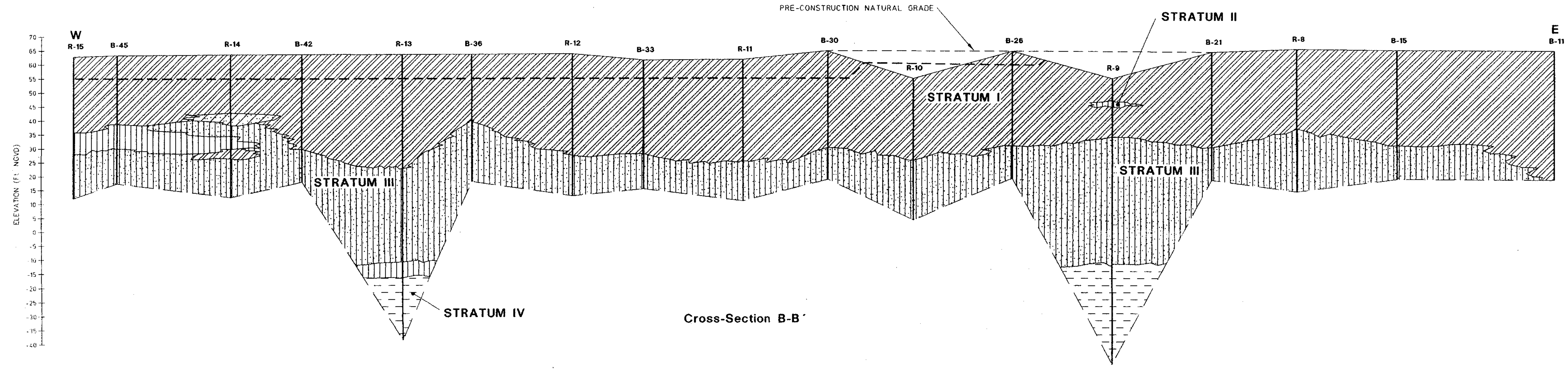


Cross-Section A-A´

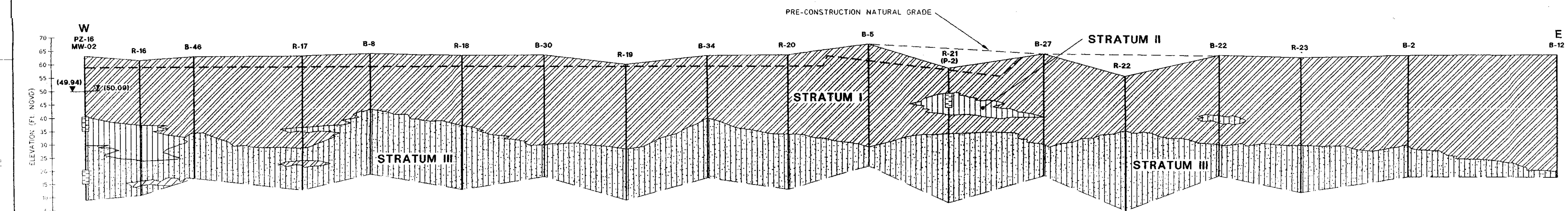


PLAN VIEW

NOT TO SCALE



Cross-Section B-B´



Cross-Section C-C´

LEGEND

- INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS (CH) AND INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS (CL)
- INORGANIC SILTS WITH SLIGHT TO NO PLASTICITY SILTY, CLAYEY, SAND OR SILTS (ML)
- SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES (SM) AND POORLY GRADED SANDS, GRAVELLY SANDS (SP)
- CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES (SC)
- CLAY SHALE
- APPROXIMATE BASE GRADE
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM I (6/25/96)
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM II (6/25/96)
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM III (6/25/96)

NOTE: 1. SOIL BORING (B-1) COMPLETED BY SWL (1984)
2. SOIL BORING (R-1) COMPLETED BY RUST E&I (1994)
3. STRATIGRAPHY DEVELOPED BASED ON RUST E&I AND SWL BORINGS
SOIL CONDITIONS INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY.

0 feet 200
Scale
Horizontal Scale: 1" = 200'
Vertical Scale: 1" = 20'

Description		Date	Ini.
Drawn By	PARTIN	3/96	
Designer	DAY	3/96	
Checked	CALDWELL	3/96	
P.E.			
Approved			
Revision			
Revision			
Revision			
Project No.	32711.100		
Drawing No.	32711A55.DWG		
Date Issued	07-22-96		
Plot Time	3:25 p.m.		

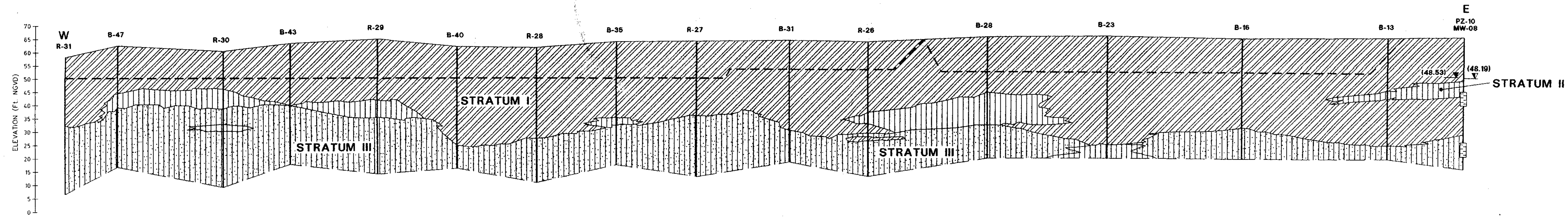
RUST ENVIRONMENT & INFRASTRUCTURE

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

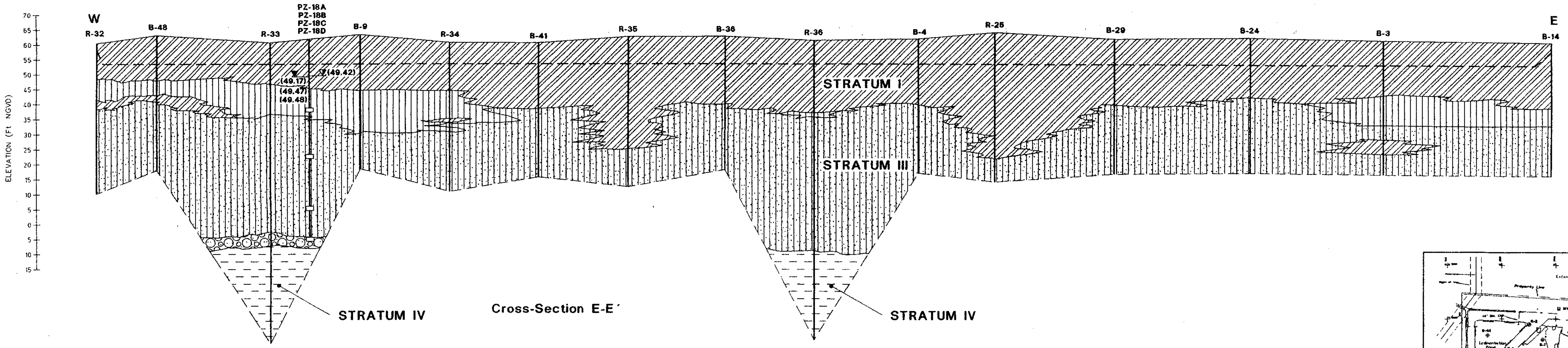
WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

GEOLOGIC CROSS-SECTIONS

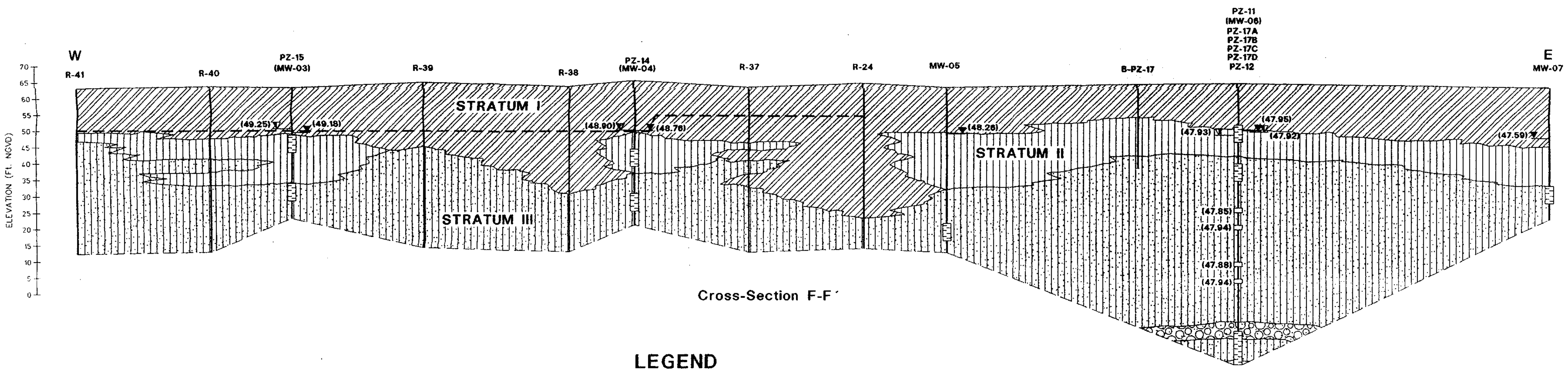
8-A
FIGURE NO.



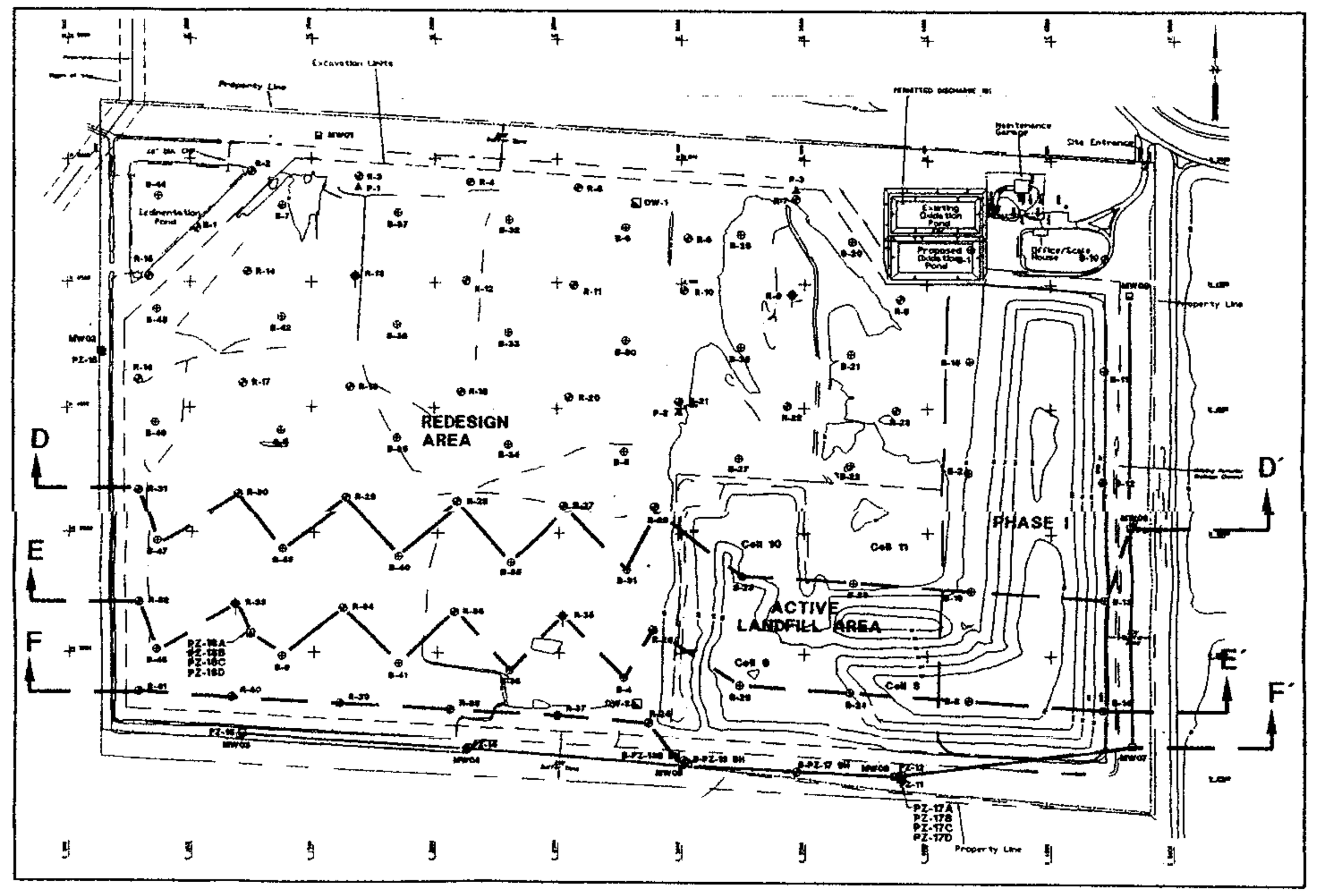
Cross-Section D-D´



Cross-Section E-E´



Cross-Section F-F´



PLAN VIEW

NOT TO SCALE

LEGEND

- INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS (CH) AND INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS (CL)
- INORGANIC SILTS WITH SLIGHT TO NO PLASTICITY. SILTY, CLAYEY, SAND OR SILTS (ML)
- SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES (SM) AND POORLY GRADED SANDS, GRAVELY SANDS (SP)
- WELL GRADED SANDS, SAND-GRAVEL MIXTURES (SW)
- CLAY SHALE
- APPROXIMATE BASE GRADE
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM II (6/25/96)
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM III (6/25/96)
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) AT THE BASE OF STRATUM III (6/25/96)

0 Feet 200
Scale
Horizontal Scale 1" = 200'
Vertical Scale 1" = 20'

NOTE: 1. SOIL BORING (B-1) COMPLETED BY SWL (1984)
2. SOIL BORING (R-1) COMPLETED BY RUST E&I (1994)
3. STRATIGRAPHY DEVELOPED BASED ON RUST E&I AND SWL BORINGS. SOIL CONDITIONS INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY.

Description		Date	Int.
Drawn By:	PARTIN	3/96	
Designer	DAY	DATE	
Checked	CALDWELL	DATE	
P.E.			
Approved			
Revision			
Revision			
Revision			
Project No.	32711.100		
Drawing No.	32711AS6.DWG		
Date Issued	07-23-96		
Plot Time	9:35 a.m.		

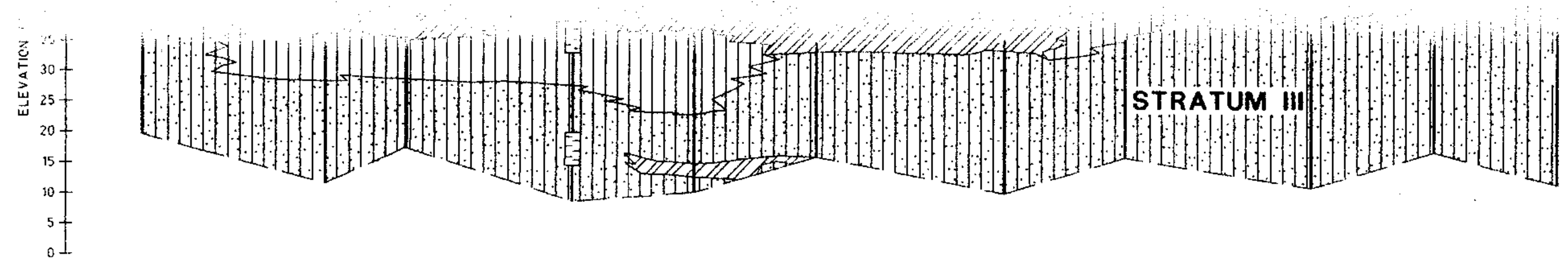
RUST ENVIRONMENT & INFRASTRUCTURE

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

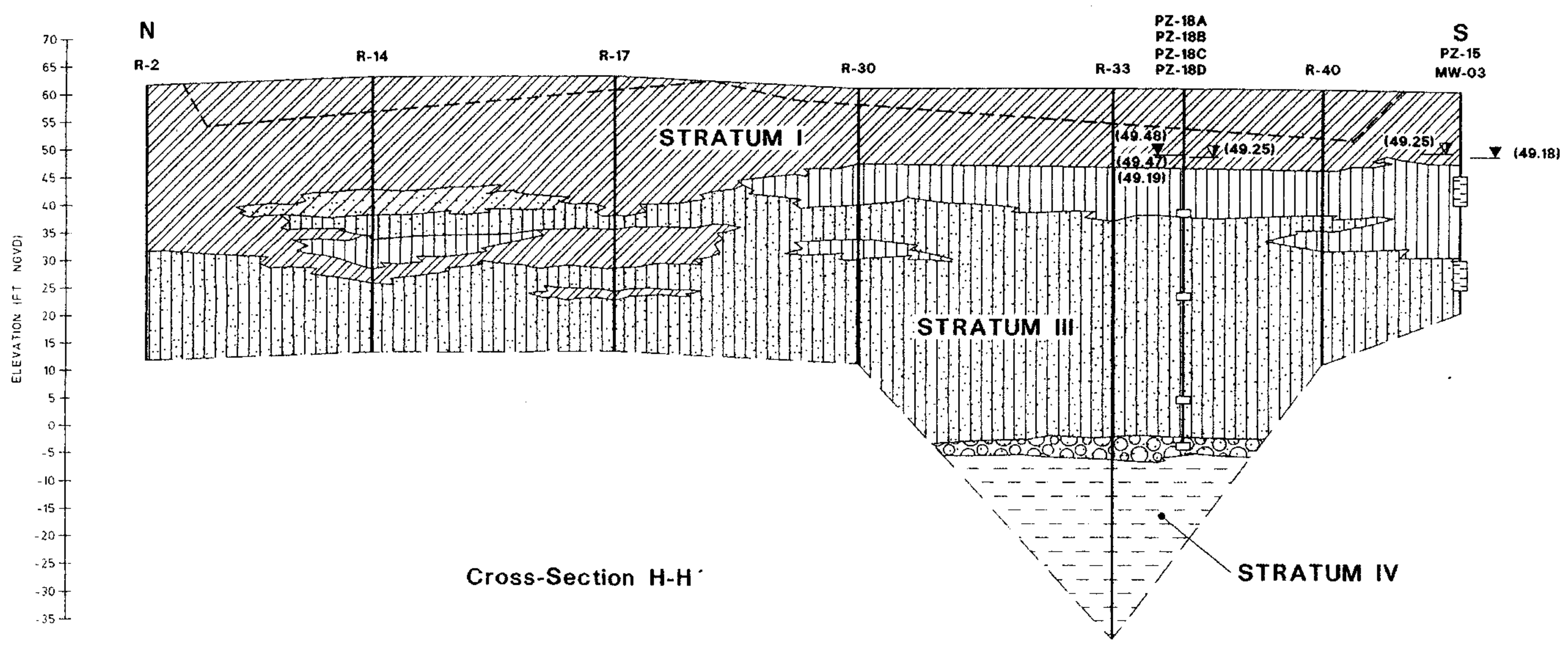
WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

GEOLOGIC CROSS-SECTIONS

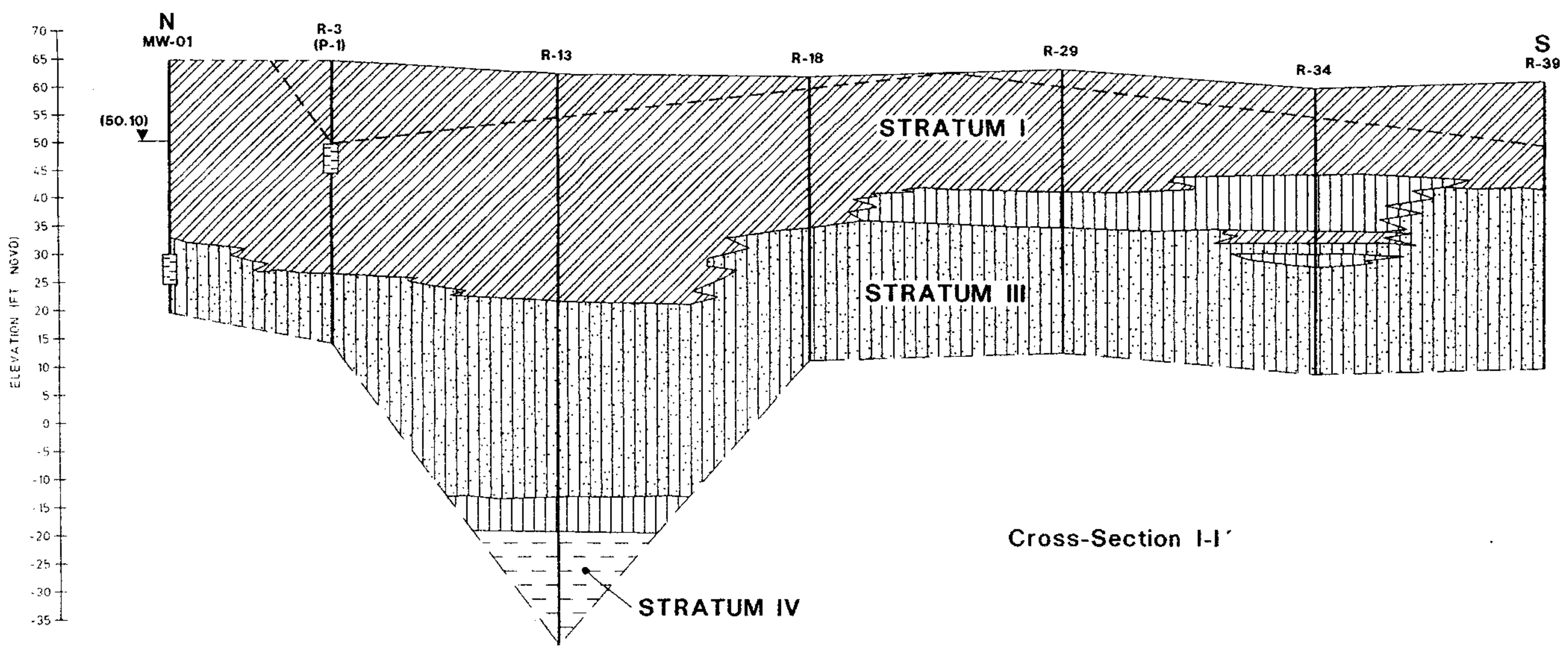
8-B
FIGURE NO.



Cross-Section G-G´

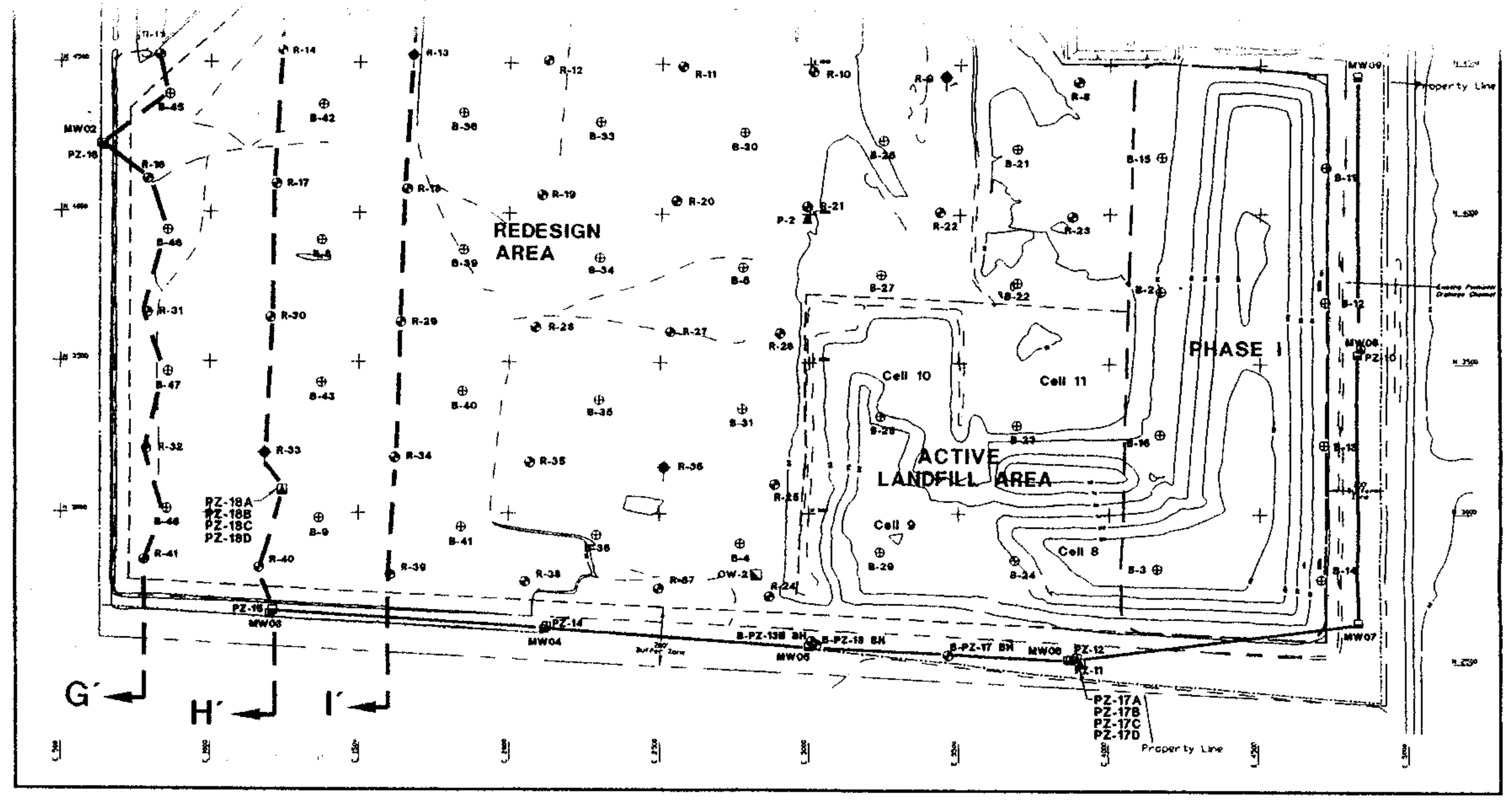


Cross-Section H-H´



Cross-Section I-I´

NOTE: 1. SOIL BORINGS (B-1) COMPLETED BY SWL (1984)
2. SOIL BORINGS (R-1) COMPLETED BY RUST E&I (1994)
3. STRATIGRAPHY DEVELOPED BASED ON RUST E&I AND SWL BORINGS. SOIL CONDITIONS INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY.



PLAN VIEW

NOT TO SCALE

LEGEND

- INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS (CH) AND INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS (CL)
- INORGANIC SILTS WITH SLIGHT TO NO PLASTICITY SILTY, CLAYEY, SAND OR SILTS (ML)
- SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES (SM) AND POORLY GRADED SANDS, GRAVELY SANDS (SP)
- CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES (SC)
- WELL GRADED SANDS, SAND-GRAVEL MIXTURES (SW)
- CLAY SHALE
- APPROXIMATE BASE GRADE
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM I (6/25/96)
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM II (6/25/96)
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM III (6/25/96)

0 feet 200
Scale
Horizontal Scale 1" = 200
Vertical Scale 1" = 20'

Description		Date	In.
Drawn By	PARTIN	3/96	
Designer	DAY	3/96	
Checked	CALDWELL	3/96	
P.E.			
Approved			
Revision			
Revision			
Revision			
Project No	32711.100		
Drawing No	32711A54.DWG		
Date Issued	07-23-96		
Plot Time	9:09 a.m.		

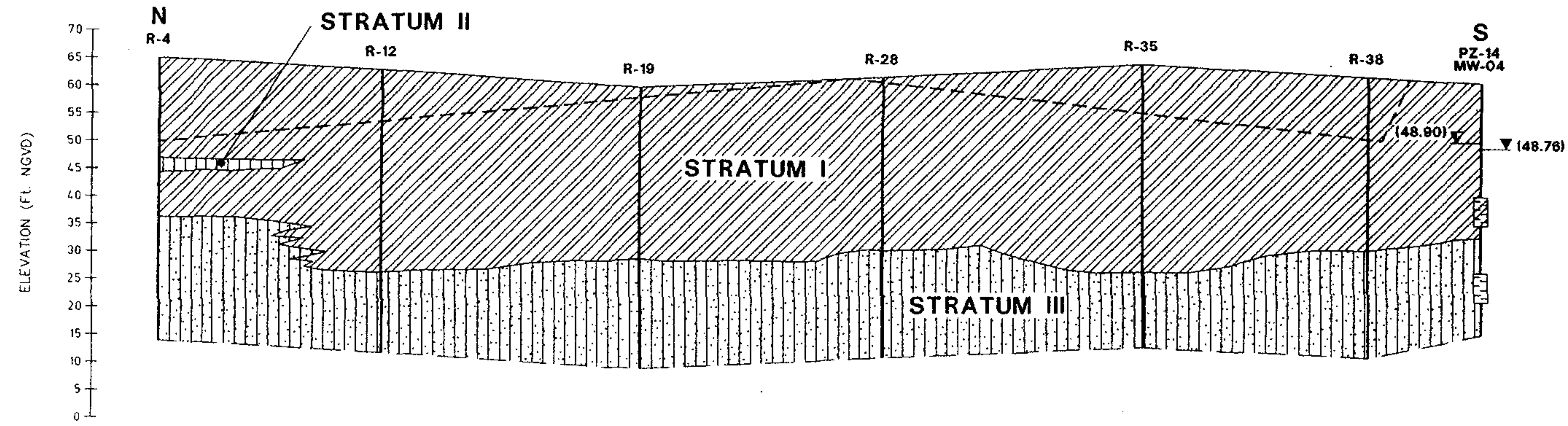
RUST ENVIRONMENT & INFRASTRUCTURE

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

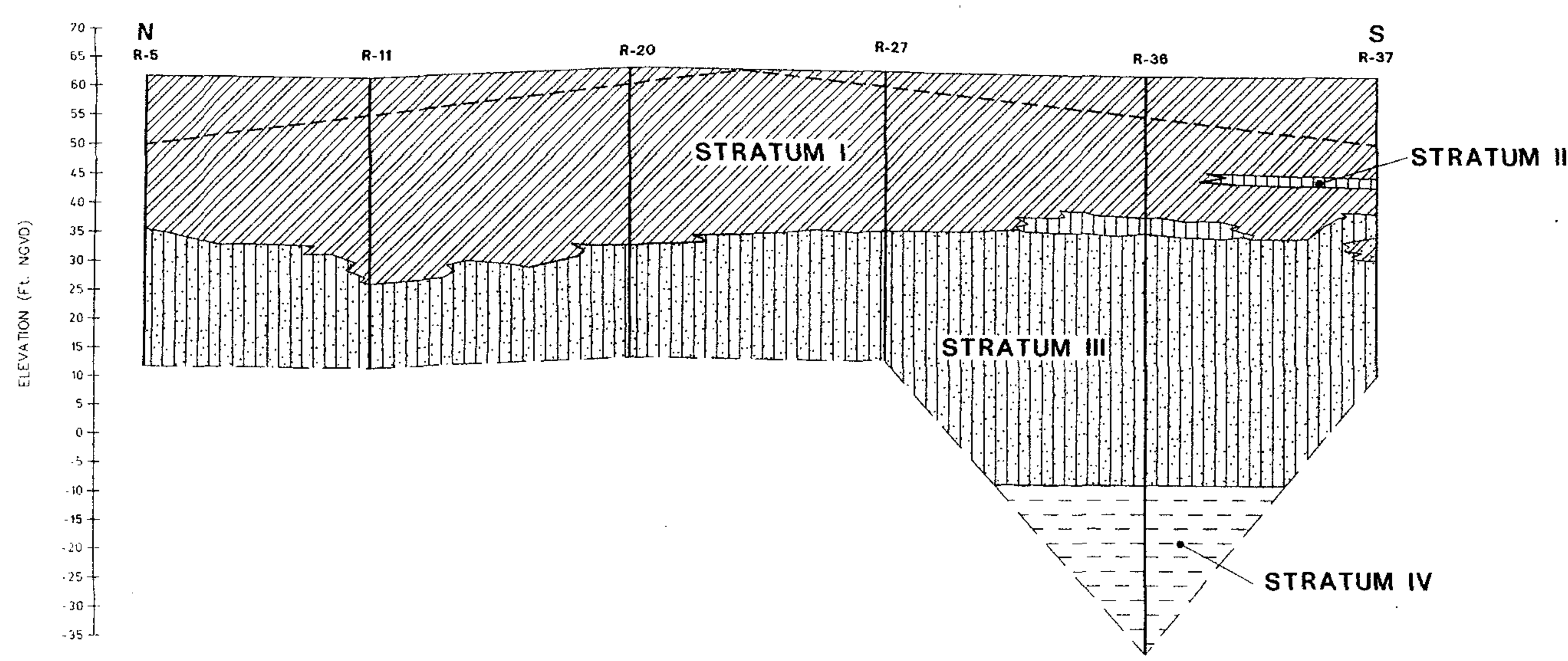
WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

GEOLOGIC CROSS-SECTIONS

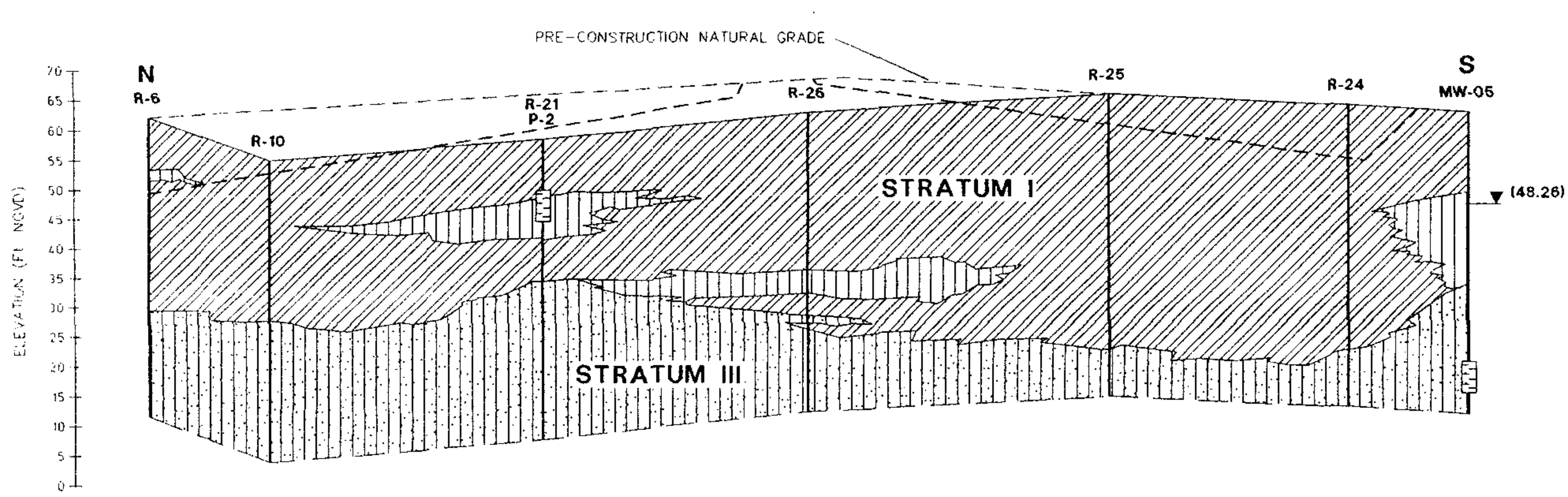
8-C
FIGURE NO



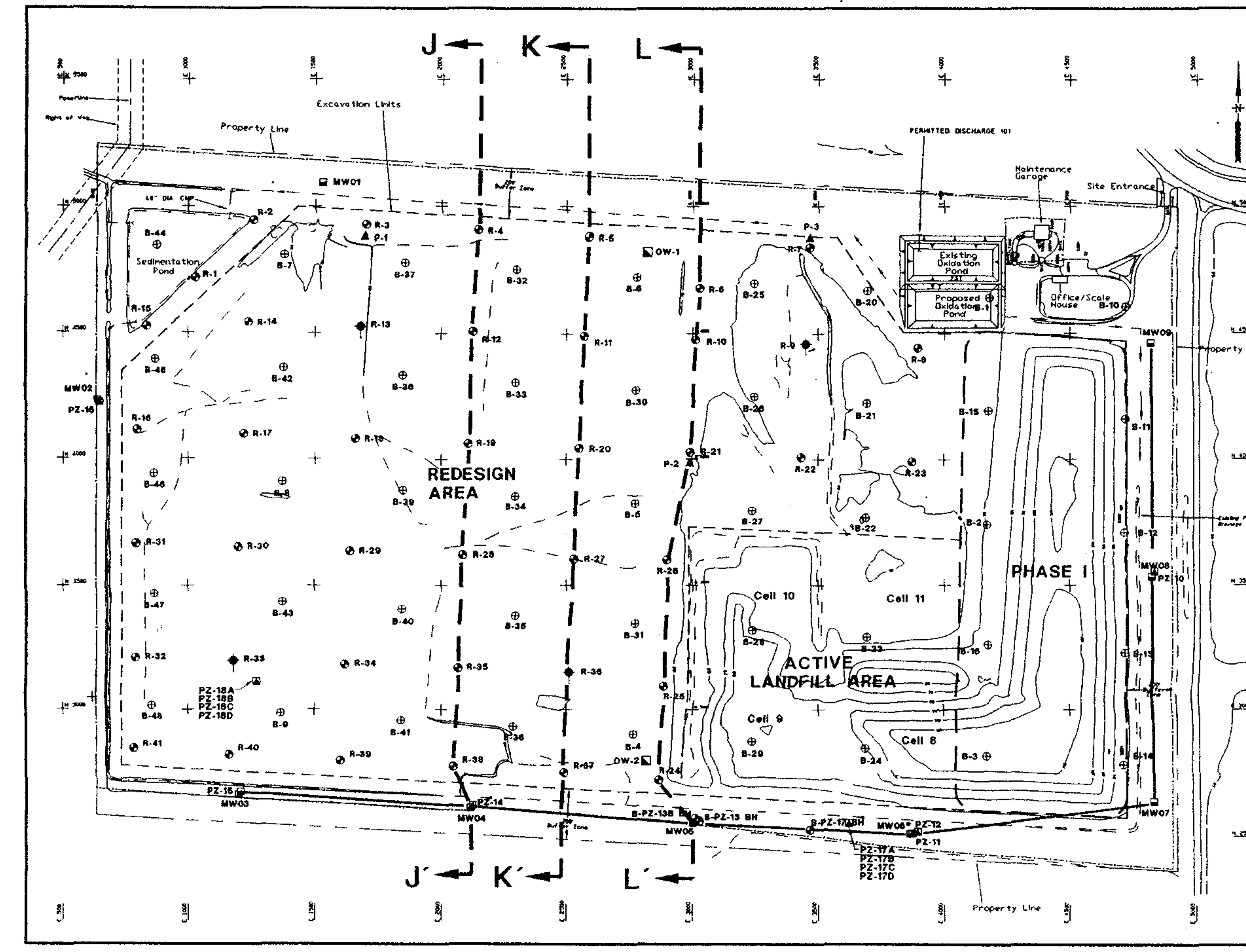
Cross-Section J-J´



Cross-Section K-K´



Cross-Section L-L´



PLAN VIEW

NOT TO SCALE

LEGEND

INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS (CH) AND INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS (CL)

INORGANIC SILTS WITH SLIGHT TO NO PLASTICITY SILTY, CLAYEY, SAND OR SILTS (ML)

SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES (SM) POORLY GRADED SANDS, GRAVELLY SANDS (SP)

CLAY SHALE

APPROXIMATE BASE GRADE

POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM I (6/25/96)

POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM II (6/25/96)

POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM III (6/25/96)

NOTE: 1.SOIL BORING (B-1) COMPLETED BY SWL (1984)
2.SOIL BORING (R-1) COMPLETED BY RUST E&I (1994)
3.STRATIGRAPHY DEVELOPED BASED ON RUST E&I AND SWL BORINGS
SOIL CONDITIONS INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY.

0 feet 200
Scale
Horizontal Scale 1" = 200'
Vertical Scale 1" = 20'

Description		Date	Int
Drawn By	PARTIN	3/96	
Designer	DAY	3/96	
Checked	CALDWELL	3/96	
P.E.			
Approved			
Revision			
Revision			
Revision			
Project No	32711.100		
Drawing No	32711AS2.DWG		
Date Issued	10-30-96		
Plot Time	5:17 p.m.		

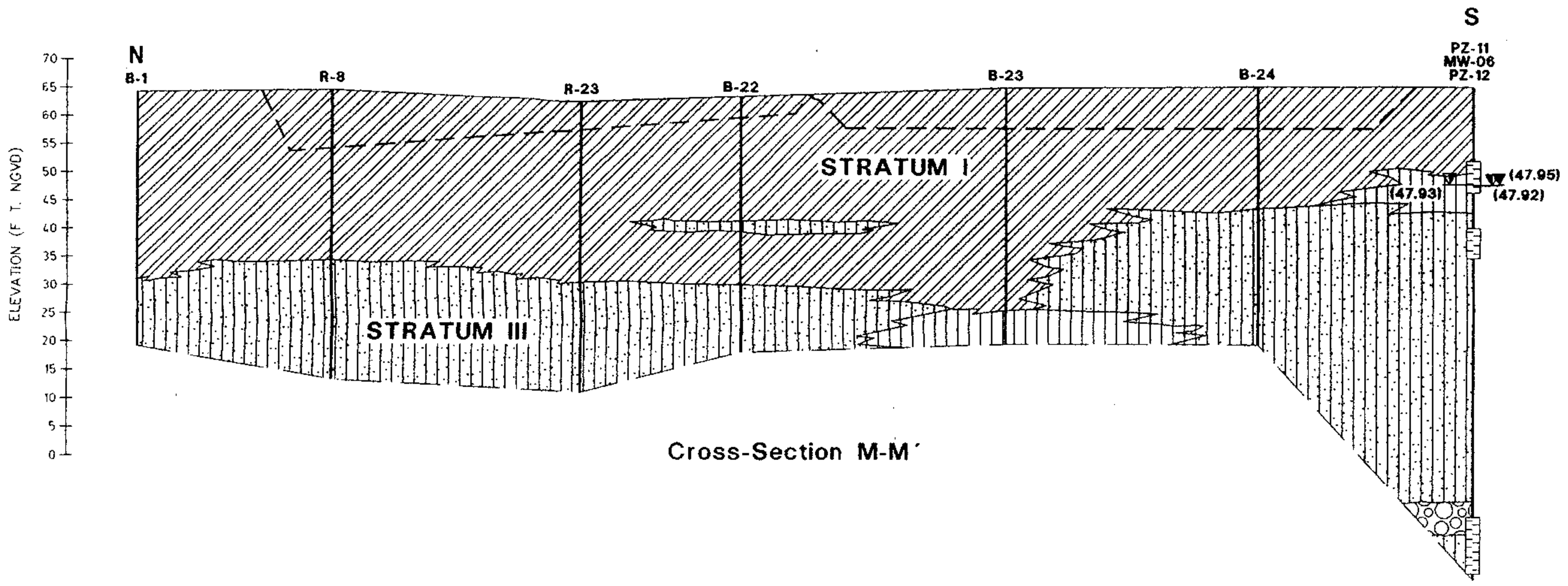
RUST ENVIRONMENT & INFRASTRUCTURE

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

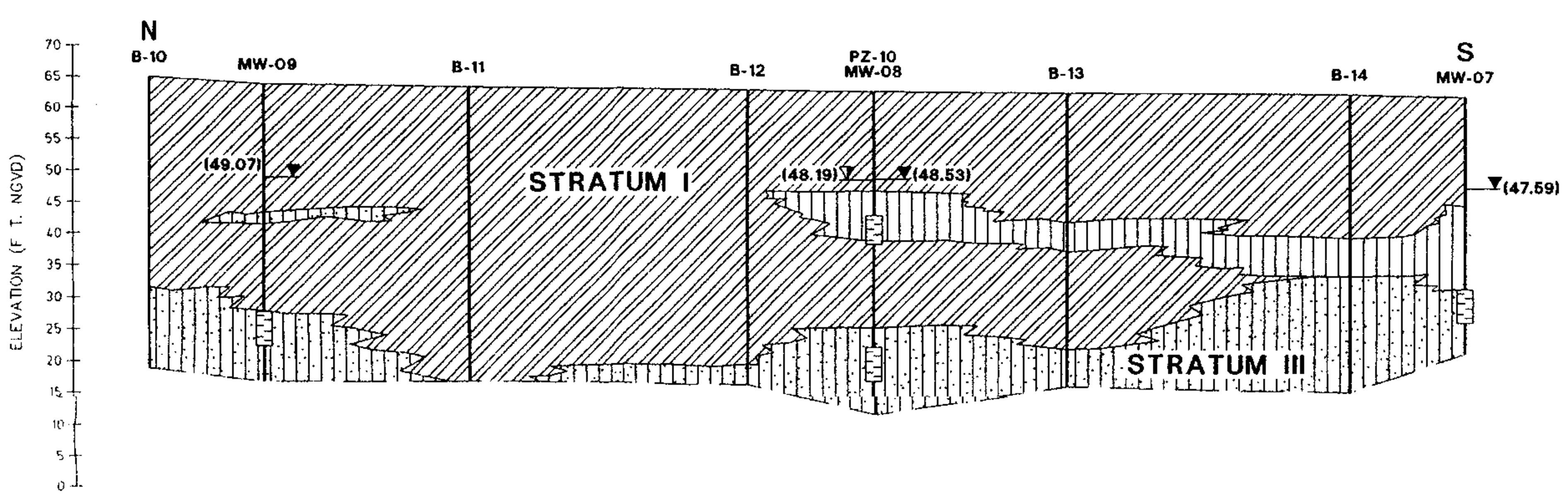
WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

GEOLOGIC CROSS-SECTIONS

8-D
FIGURE NO



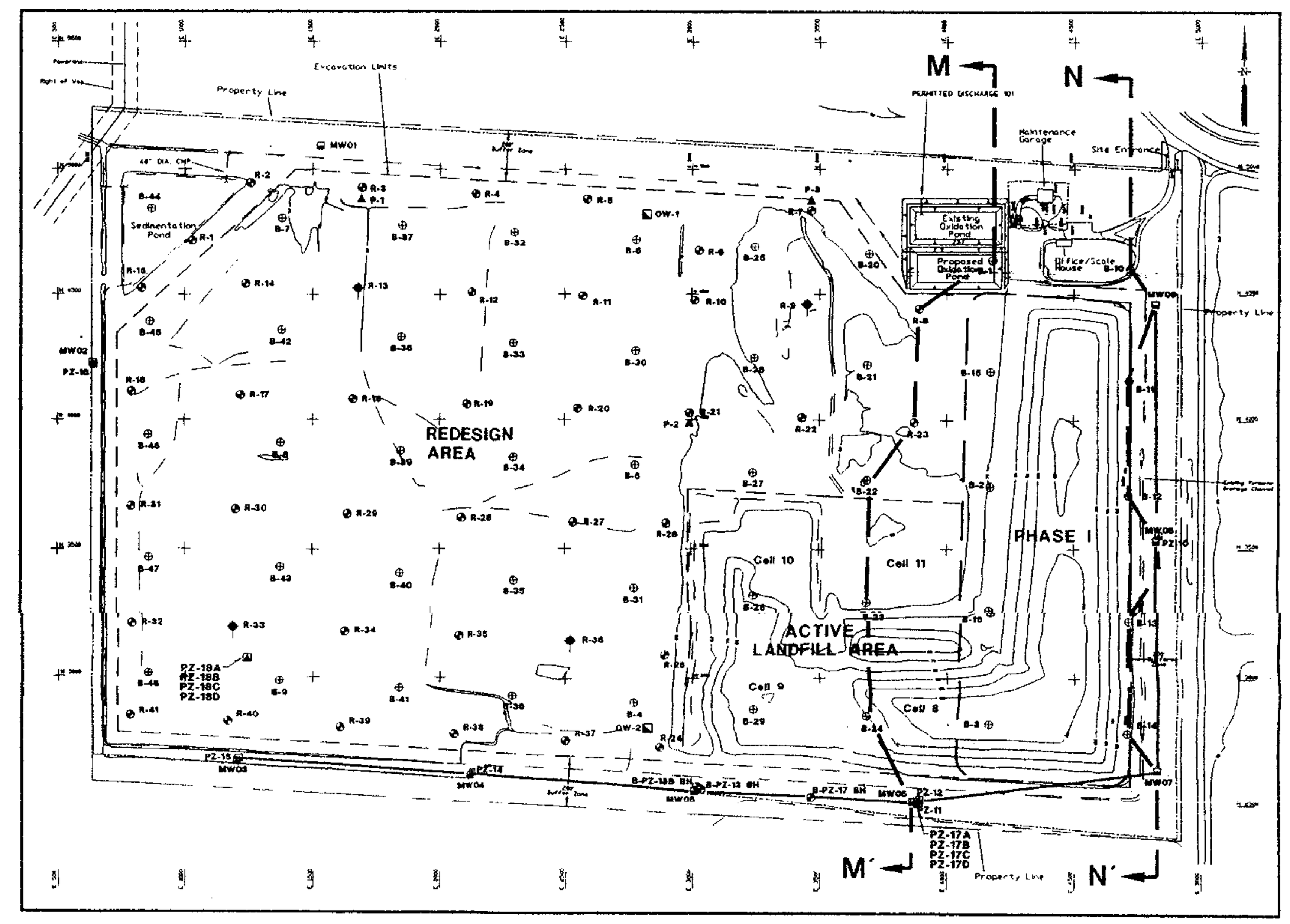
Cross-Section M-M´



Cross-Section N-N´

LEGEND

- INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS (CH) AND INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS (CL)
- INORGANIC SILTS WITH SLIGHT TO NO PLASTICITY SILTY, CLAYEY, SAND OR SILTS (ML)
- SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES (SM) AND POORLY GRADED SANDS, GRAVELY SANDS (SP)
- CLAY SHALE
- GRAVEL (GP)
- APPROXIMATE BASE GRADE
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM I (6/25/96)
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM II (6/25/96)
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) IN STRATUM III (6/25/96)
- POTENTIOMETRIC SURFACE ELEVATION (Ft-NGVD) AT THE BASE OF STRATUM III (6/25/96)



PLAN VIEW

NOT TO SCALE

0 feet 200
Scale
Horizontal Scale 1" = 200'
Vertical Scale 1" = 20'

Description		Date	Ini.
Drawn By	PARTIN	3/96	
Designer	DAY	3/96	
Checked	CALDWELL	3/96	
P.E.			
Approved			
Revision			
Revision			
Revision			
Project No	32711.100		
Drawing No	32711AS7.DWG		
Date Issued	07-22-96		
Plot Time	2:52 p.m.		

RUST ENVIRONMENT & INFRASTRUCTURE

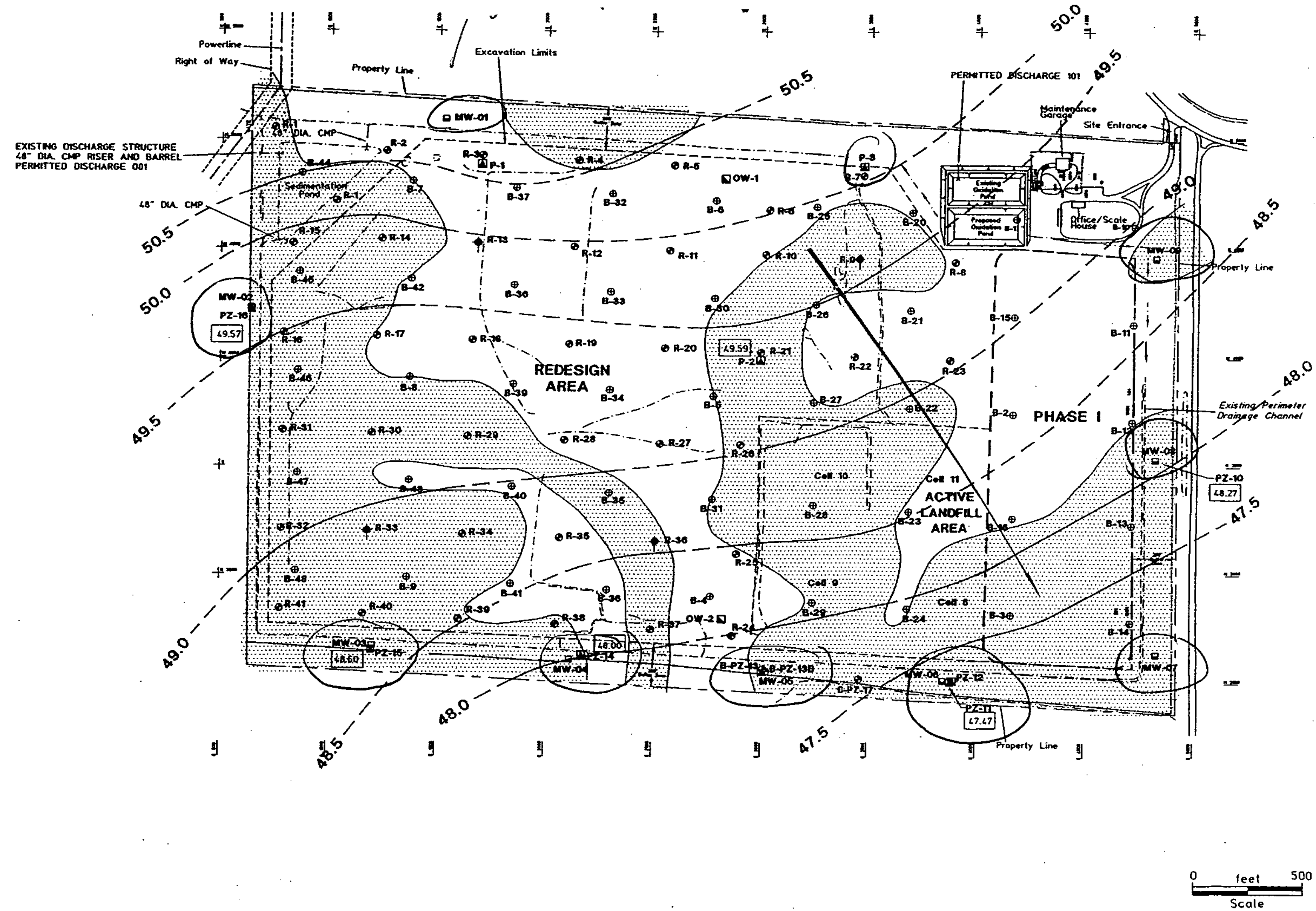
PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

GEOLOGIC CROSS-SECTIONS

8-E
FIGURE NO.

NOTE: 1. SOIL BORINGS (B-1) COMPLETED BY SWL (1984)
2. SOIL BORINGS (R-1) COMPLETED BY RUST E&I (1994)
3. STRATIGRAPHY DEVELOPED BASED ON RUST E&I AND SWL BORINGS. SOIL CONDITIONS INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY.



LEGEND

- LIMIT OF PHASE I
- SURFACE WATER FLOW DIRECTION
- GRID COORDINATE
- PROPERTY BOUNDARY
- EXISTING FENCE
- EXISTING CULVERT
- EXISTING GROUNDWATER MONITORING WELL
- RUST E & I BORING LOCATION
- RUST E & I 100' BORING LOCATION
- SOUTHWEST LABORATORIES, INC. 1984 BORING LOCATION (APPROX.)
- ABANDONED OBSERVATION WELL LOCATION
- RUST E & I PIEZOMETER LOCATION
- 47.50 POTENTIOMETRIC ELEVATION (FT. NGVD)
- GROUNDWATER FLOW DIRECTION (2/12/96)
- EXTENT OF STRATUM II

NOTES:

1. PZ-12 IS A DEEP (85-100') PIEZOMETER.

Re: Permit Installation Report file No. 32711 Dwg. 32711CSP.DWG.

Drawn By:	D. ARDIS	1/96	Project No.	32711.100				
Designer:	S. REED	1/96	Drawing No.	32711ASP.DWG				
P.E.			Date Issued:	07-23-96				
Approved:	H. CALDWELL	1/96	Plot Time:	10:58 a.m.	DATE	NO.	REVISION	BY

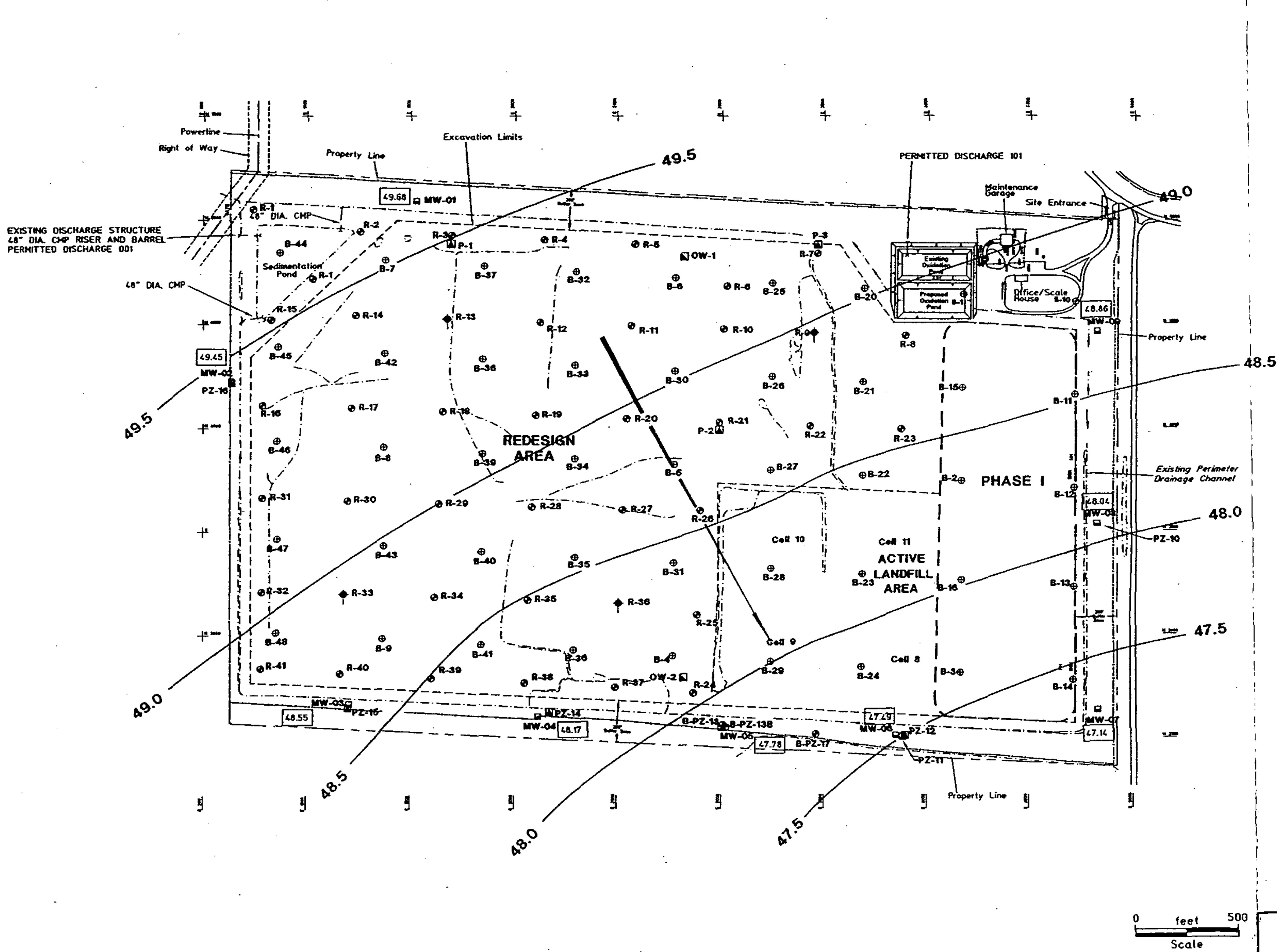
WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

RUST ENVIRONMENT & INFRASTRUCTURE

STRATUM II POTENTIOMETRIC SURFACE MAP (2/12/96)

9A



LEGEND

- LIMIT OF PHASE I
- SURFACE WATER FLOW DIRECTION
- GRID COORDINATE
- PROPERTY BOUNDARY
- EXISTING FENCE
- EXISTING CULVERT
- EXISTING GROUNDWATER MONITORING WELL
- RUST E & I BORING LOCATION
- RUST E & I 100' BORING LOCATION
- SOUTHWEST LABORATORIES, INC. 1984 BORING LOCATION (APPROX.)
- ABANDONED OBSERVATION WELL LOCATION
- RUST E & I PIEZOMETER LOCATION
- 47.50 POTENTIOMETRIC ELEVATION (FT. NGVD)
- GROUNDWATER FLOW DIRECTION (2/12/96)

NOTES:

1. PZ-12 IS A DEEP (85-100') PIEZOMETER.

Re: Permit Installation Report file No. 32711 Dwg. 32711CSP.DWG.

Drawn By:	D. ARDIS	1/96	Project No.	32711.100				
Designer:	S. REED	1/96	Drawing No.	32711ASP.DWG				
P.E.			Date Issued:	07-23-96				
Approved:	M. CALDWELL	1/96	Plot Time:	11:26 a.m.	DATE	NO.	REVISION	BY

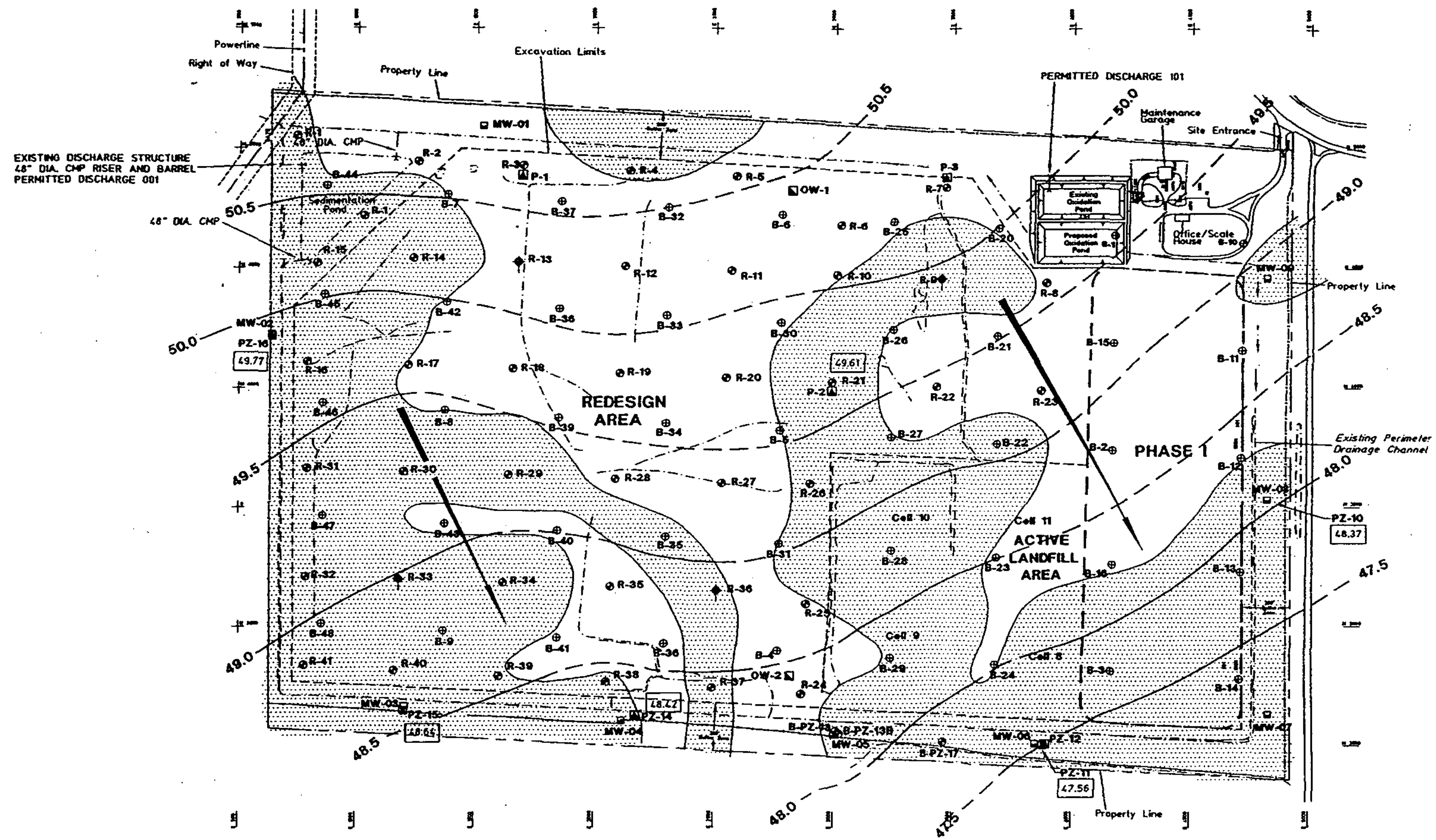
WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

RUST ENVIRONMENT & INFRASTRUCTURE

STRATUM III POTENTIOMETRIC SURFACE MAP 2/12/96

9B
FIG. NO.



LEGEND

- LIMIT OF PHASE I
- SURFACE WATER FLOW DIRECTION
- GRID COORDINATE
- PROPERTY BOUNDARY
- EXISTING FENCE
- EXISTING CULVERT
- EXISTING GROUNDWATER MONITORING WELL
- RUST E & I BORING LOCATION
- RUST E & I 100' BORING LOCATION
- SOUTHWEST LABORATORIES, INC. 1984 BORING LOCATION (APPROX.)
- ABANDONED OBSERVATION WELL LOCATION
- RUST E & I PIEZOMETER LOCATION
- 47.50 POTENTIOMETRIC ELEVATION (FT. NGVD)
- GROUNDWATER FLOW DIRECTION (2/27/96)
- EXTENT OF STRATUM II

NOTES:

1. PZ-12 IS A DEEP (85-100') PIEZOMETER.

Re: Permit Installation Report file No. 32711 Dwg. 32711CSP.DWG.

Drawn By:	D. ARDIS	1/96	Project No.	32711.100					
Designer:	S. REED	1/96	Drawing No.	32711ASP.DWG					
P.E.			Date Issued:	07-23-96					
Approved:	M. CALDWELL	1/96	Plot Time:	11:14 a.m.	DATE	NO.	REVISION	BY	

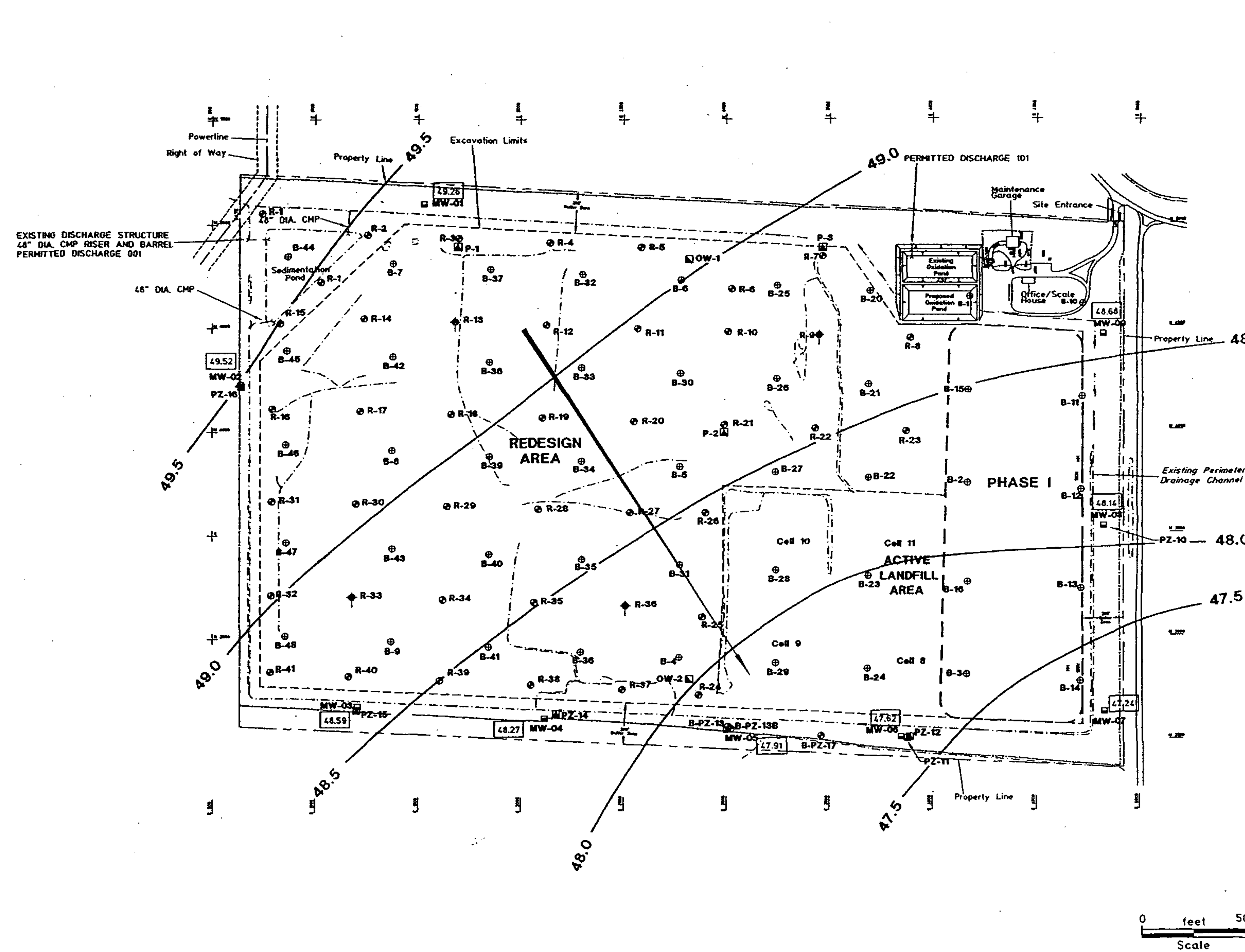
WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

RUST ENVIRONMENT & INFRASTRUCTURE

STRATUM II POTENTIOMETRIC SURFACE MAP (2/27/96)

9C
FIG. NO.



LEGEND

- LIMIT OF PHASE I
- SURFACE WATER FLOW DIRECTION
- GRID COORDINATE
- PROPERTY BOUNDARY
- EXISTING FENCE
- EXISTING CULVERT
- EXISTING GROUNDWATER MONITORING WELL
- RUST E & I BORING LOCATION
- RUST E & I 100' BORING LOCATION
- SOUTHWEST LABORATORIES, INC. 1984 BORING LOCATION (APPROX.)
- ABANDONED OBSERVATION WELL LOCATION
- RUST E & I PIEZOMETER LOCATION
- 47.50 POTENTIOMETRIC ELEVATION (FT. NGVD)
- GROUNDWATER FLOW DIRECTION (2/27/96)

NOTES:

1. PZ-12 IS A DEEP (85-100') PIEZOMETER.
2. MW-05 WAS NOT UTILIZED BUT IS INCLUDED FOR INFORMATION PURPOSES ONLY.

Re: Permit Installation Report file No. 32711 Dwg. 32711CSP.DWG.

Drawn By:	D. ARDIS	1/96	Project No.	32711.100				
Designer:	S. REED	1/96	Drawing No.	32711ASP.DWG				
P.E.			Date Issued:	07-23-96				
Approved:	H. CALDWELL	1/96	Plot Time:	11:07 a.m.	DATE	NO.	REVISION	BY

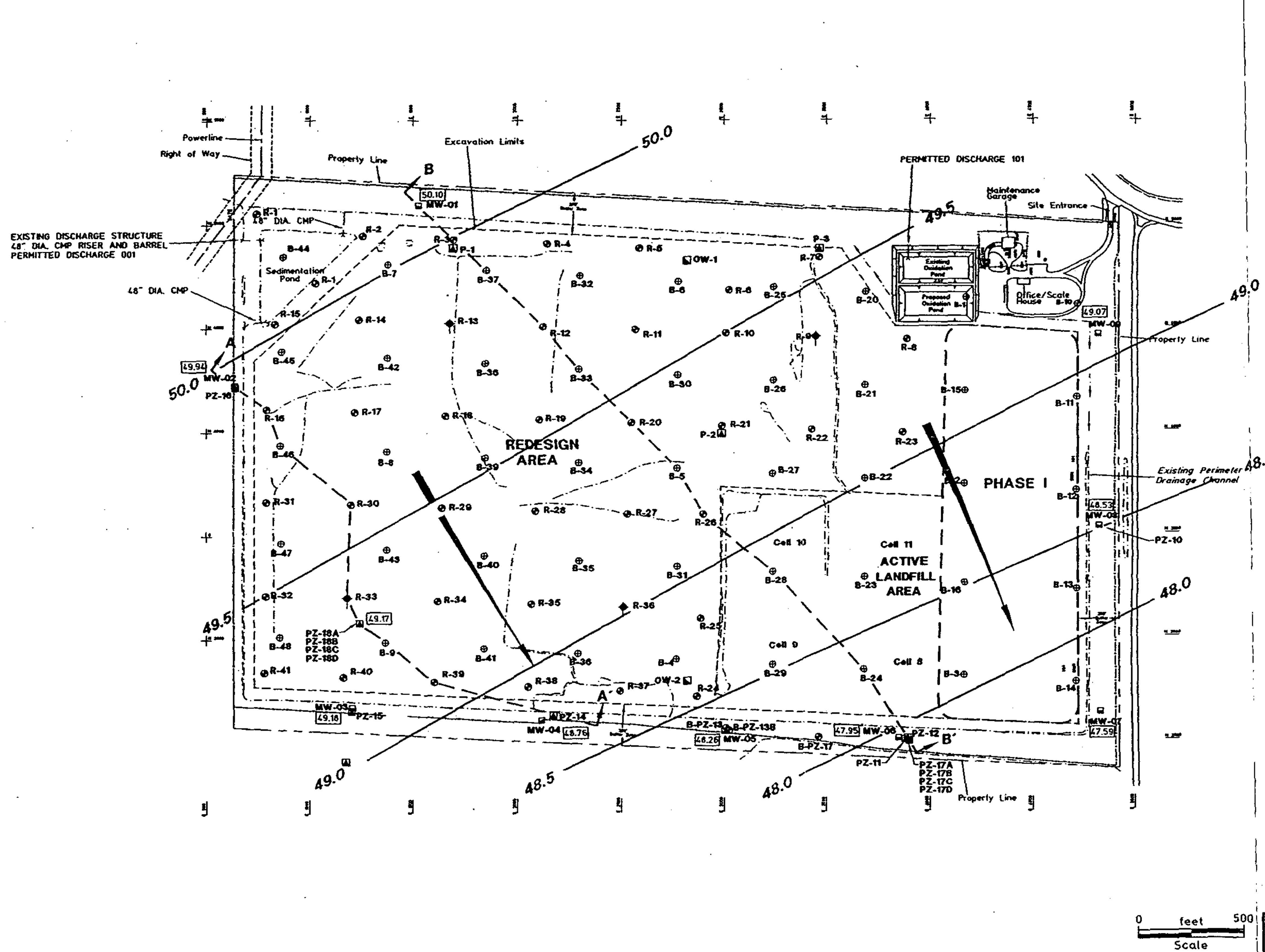
WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

RUST ENVIRONMENT & INFRASTRUCTURE

STRATUM III POTENTIOMETRIC SURFACE MAP (2/27/96)

9D
FIG. NO.



LEGEND

------	LIMIT OF PHASE I
— - —	SURFACE WATER FLOW DIRECTION
	GRID COORDINATE
———	PROPERTY BOUNDARY
———	EXISTING FENCE
	EXISTING CULVERT
	EXISTING GROUNDWATER MONITORING WELL
	RUST E & I BORING LOCATION
	RUST E & I 100' BORING LOCATION
	SOUTHWEST LABORATORIES, INC. 1984 BORING LOCATION (APPROX.)
	ABANDONED OBSERVATION WELL LOCATION
	RUST E & I PIEZOMETER LOCATION
A A'	SECTION LOCATION LINES
– 50.0 –	POTENTIOMETRIC CONTOUR
50.10	POTENTIOMETRIC SURFACE ELEVATION (FT. NGVD) (6/25/96)
———	GROUNDWATER FLOW DIRECTION

Re: Permit Installation Report file No. 32711 Dwg. 32711ASP.DWG.

Drawn By:	D. ARDIS	6/96	Project No.	32711.100				
Designer:	M. CALDWELL	6/96	Drawing No.	32711A13.DWG				
P.E.			Date Issued:	07-22-96				
Approved:	M. CALDWELL	6/96	Plot Time:	3:06 p.m.	DATE	NO.	REVISION	BY

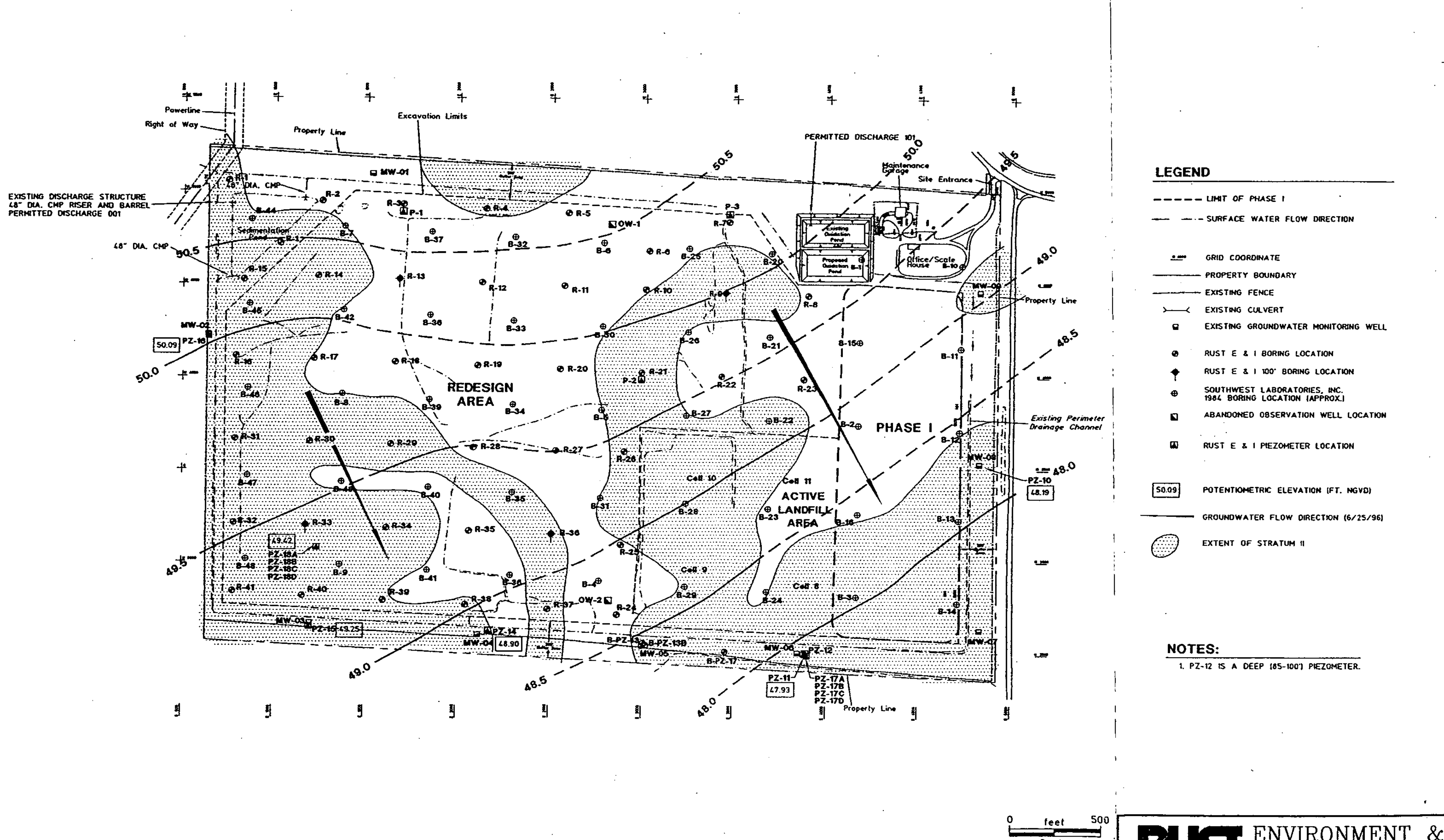
WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

RUST ENVIRONMENT & INFRASTRUCTURE

POTENTIOMETERIC CONTOUR
MAP STRATUM III (6/25/96)

9E
FIG. NO.



Re: Permit Installation Report file No. 32711 Dwg. 32711CSP.DWG.

Drawn By:	D. ARDIS	1/96	Project No.	32711.100				
Designer:	S. REED	1/96	Drawing No.	32711ASP.DWG				
P.E.			Date Issued:	09-18-96				
Approved:	H. CALDWELL	1/96	Plot Time:	2:52 p.m.	DATE	NO.	REVISION	BY

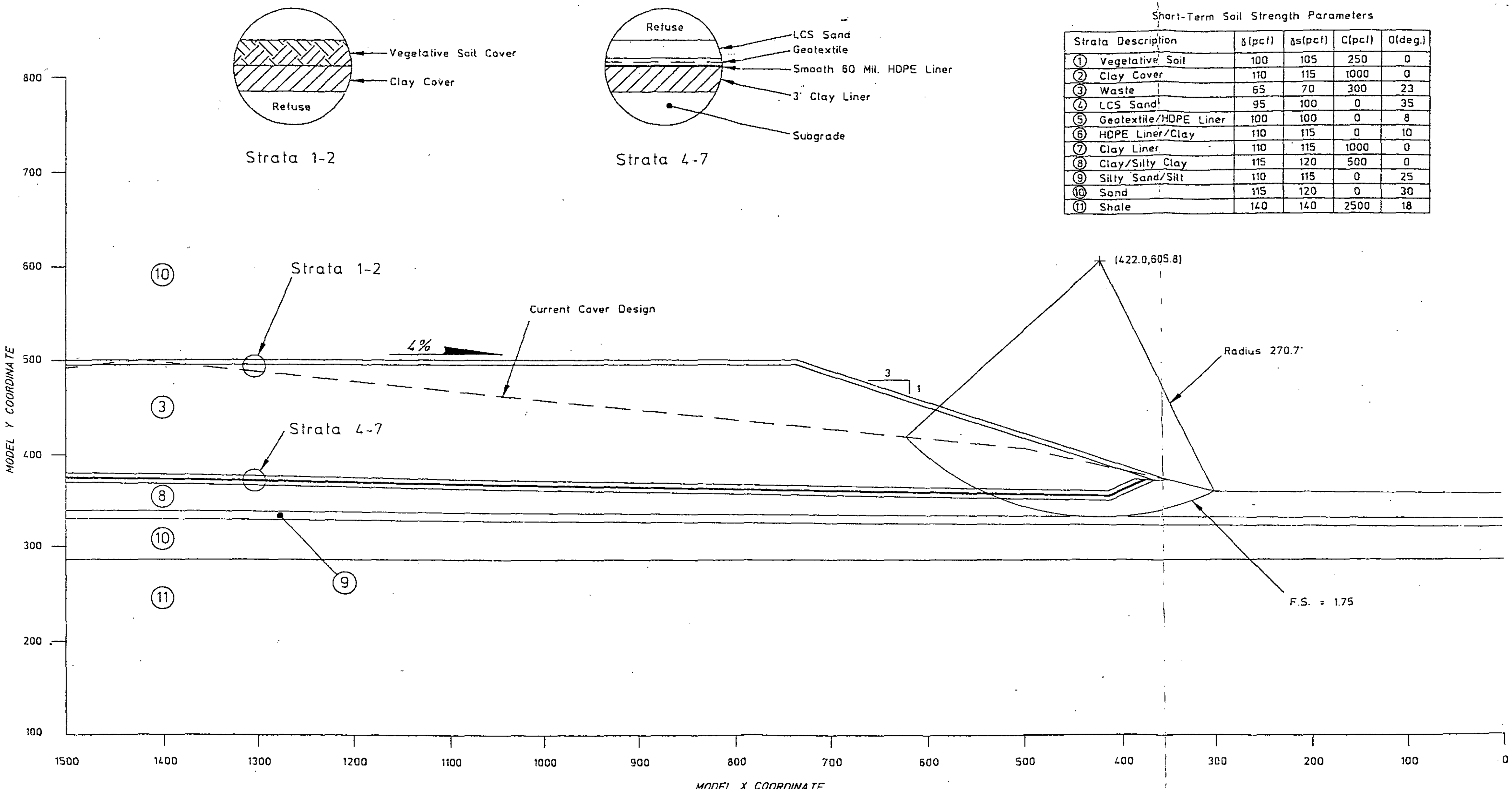
WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

RUST ENVIRONMENT & INFRASTRUCTURE

STRATUM II POTENTIOMETRIC SURFACE MAP (6/25/96)

9F
FIG. NO.



Short-Term Soil Strength Parameters

Strata Description	γ(pcf)	γs(pcf)	C(pcf)	Ø(deg.)
1 Vegetative Soil	100	105	250	0
2 Clay Cover	110	115	1000	0
3 Waste	65	70	300	23
4 LCS Sand	95	100	0	35
5 Geotextile/HDPE Liner	100	100	0	8
6 HDPE Liner/Clay	110	115	0	10
7 Clay Liner	110	115	1000	0
8 Clay/Silty Clay	115	120	500	0
9 Silty Sand/Silt	110	115	0	25
10 Sand	115	120	0	30
11 Shale	140	140	2500	18

RE: DRAWING COPIED FROM CADD FILE 32711A30.DWG ON 4/25/2001.

Drawn By:	ARDIS	5/99	Project No.	42891.010	4/2001	1	VERTICAL EXPANSION	DLS
Designer:	BLACKMAR	5/99	Drawing No.	42891A03.DWG				
P.E.	BLACKMAR	5/99	Date Issued:	04-25-01				
Approved:	BLACKMAR	5/99	Plot Time:	8:36 A M	DATE	NO.	REVISION	BY

PREPARED FOR

WASTE MANAGEMENT

PREPARED BY

EARTH TECH

Baton Rouge, Louisiana

FIGURE 10
CRITICAL FAILURE SURFACE SHORT TERM CONDITION

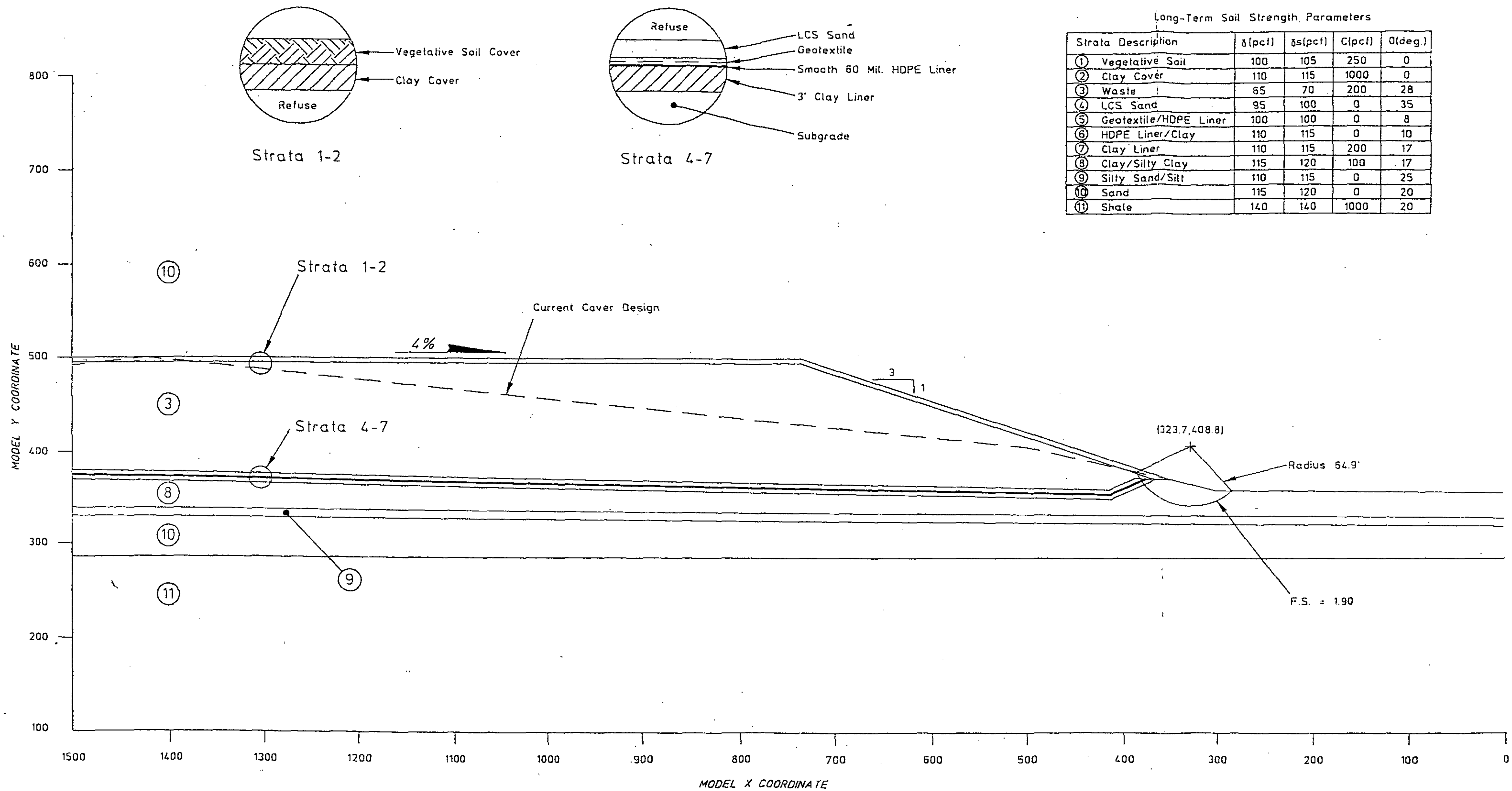
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA

APRIL 2001

42891.01

Long-Term Soil Strength Parameters

Strata Description	δ(pcf)	δs(pcf)	C(pcf)	Ø(deg.)
① Vegetative Soil	100	105	250	0
② Clay Cover	110	115	1000	0
③ Waste	65	70	200	28
④ LCS Sand	95	100	0	35
⑤ Geotextile/HDPE Liner	100	100	0	8
⑥ HDPE Liner/Clay	110	115	0	10
⑦ Clay Liner	110	115	200	17
⑧ Clay/Silty Clay	115	120	100	17
⑨ Silty Sand/Silt	110	115	0	25
⑩ Sand	115	120	0	20
⑪ Shale	140	140	1000	20



RE: DRAWING COPIED FROM CADD FILE 32711A30.DWG ON 4/25/2001.

Drawn By:	ARDIS	5/99	Project No.	42891.010	4/2001	1	VERTICAL EXPANSION	DLS
Designer:	BLACKMAR	5/99	Drawing No.	42891A03.DWG				
P.E.	BLACKMAR	5/99	Date issued:	04-25-01				
Approved:	BLACKMAR	5/99	Plot Time:	8:40 A.M	DATE	NO.	REVISION	BY

PREPARED FOR

WASTE MANAGEMENT

PREPARED BY

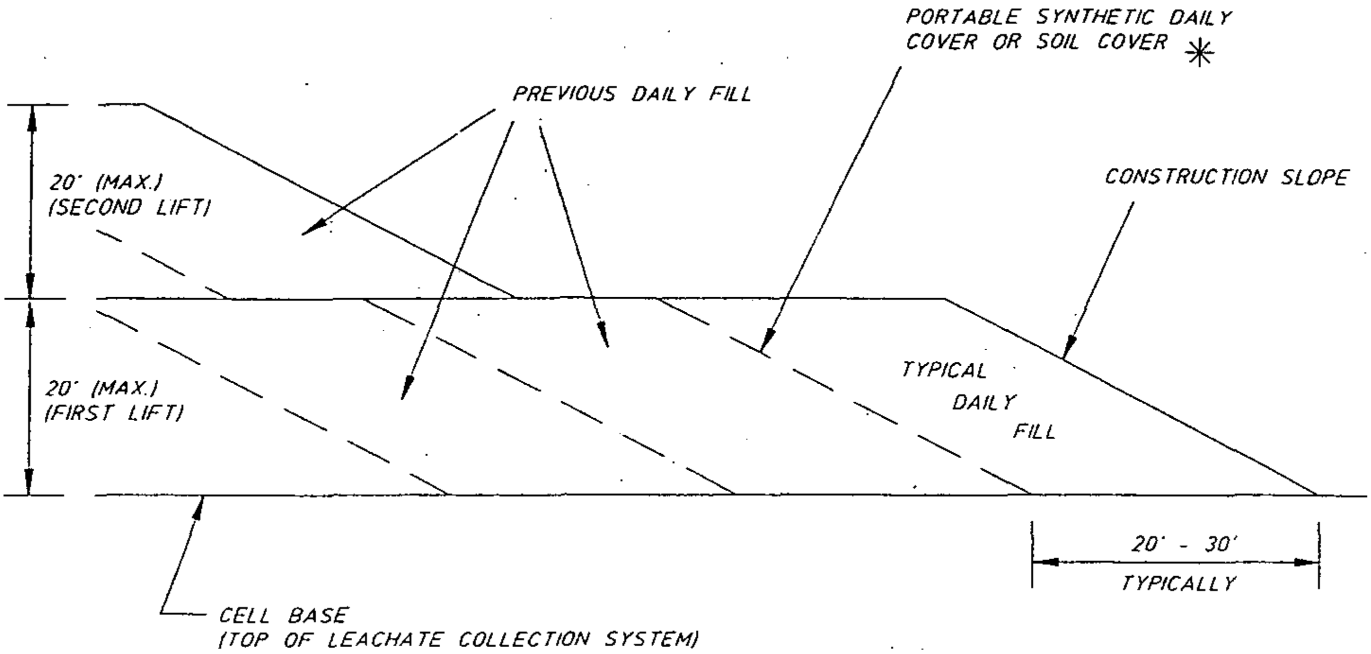
EARTH TECH

Baton Rouge, Louisiana

FIGURE 11
CRITICAL FAILURE SURFACE
LONG TERM CONDITION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA

APRIL 2001

42891.01



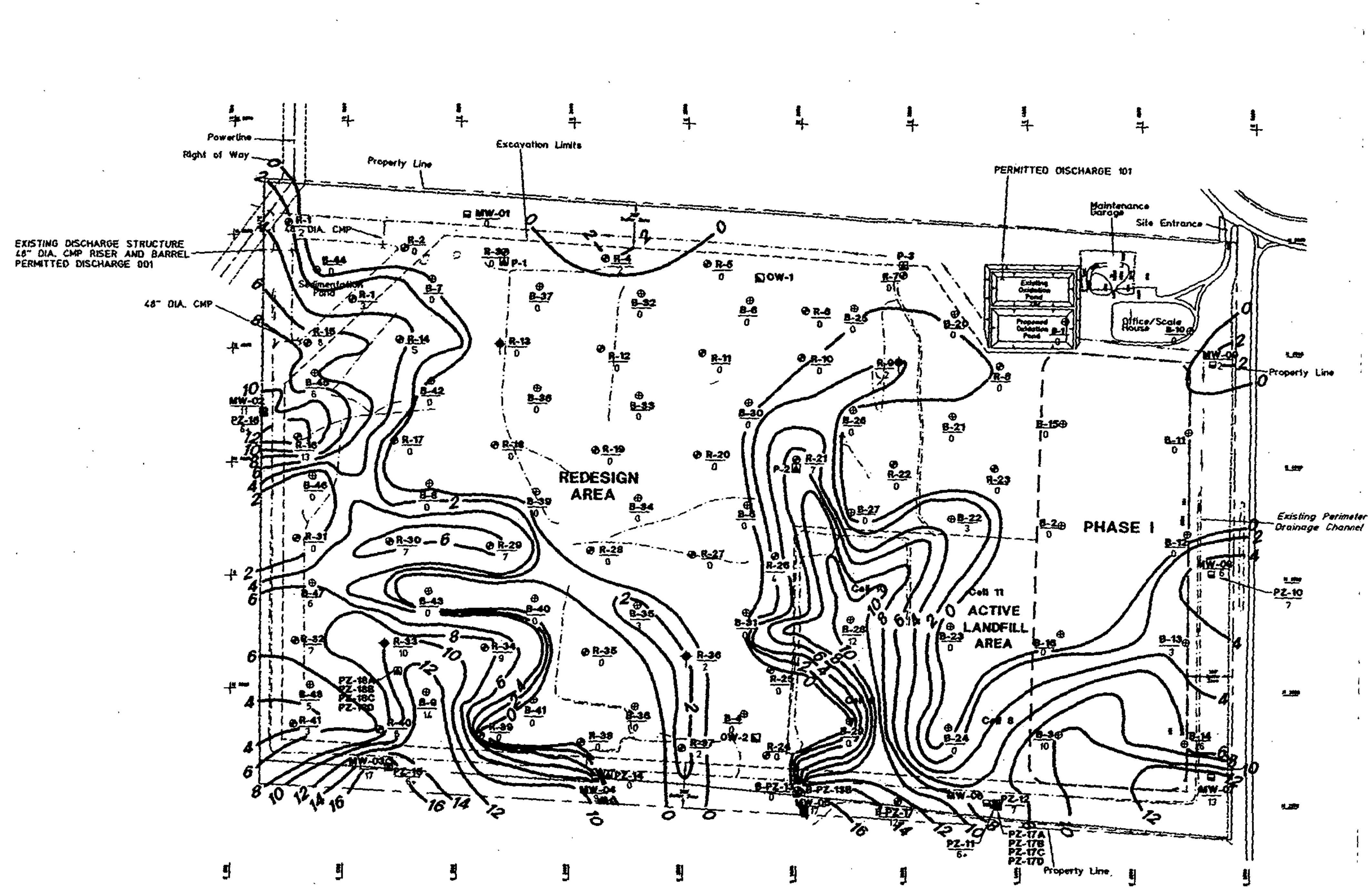
* PREVIOUS DAILY COVER IS REMOVED BEFORE NEXT DAY OF LANDFILLING

Not to Scale

Golder Associates drawing, Schematic Section Showing Approximate Dimensions of Daily Fill. (1/30/89)

RUST ENVIRONMENT & INFRASTRUCTURE

H3709.000 86415-1A 1/28/94	WASTE MANAGEMENT OF LOUISIANA, INC. Client	MAGNOLIA SANITARY LANDFILL MONROE, LOUISIANA Project Title	APPROXIMATE DIMENSIONS OF DAILY FILL
			12 Fig. No.



LEGEND

- LIMIT OF PHASE I
- SURFACE WATER FLOW DIRECTION
- GRID COORDINATE
- PROPERTY BOUNDARY
- EXISTING FENCE
- EXISTING CULVERT
- EXISTING GROUNDWATER MONITORING WELL
- RUST E & I BORING LOCATION
- RUST E & I 100' BORING LOCATION
- SOUTHWEST LABORATORIES, INC. 1984 BORING LOCATION (APPROX.)
- ABANDONED OBSERVATION WELL LOCATION
- RUST E & I PIEZOMETER LOCATION

B-35 / 4 — BORING I.D. / STRATUM THICKNESS (FEET)

NOTE:
SOIL BORINGS DENOTED IN RED INDICATE STRATUM II AND STRATUM III ARE IN CONTACT.

0 feet 500
Scale

RUST ENVIRONMENT & INFRASTRUCTURE

Re: Permit Installation Report file No. 32711 Dwg. 32711CSP.DWG.

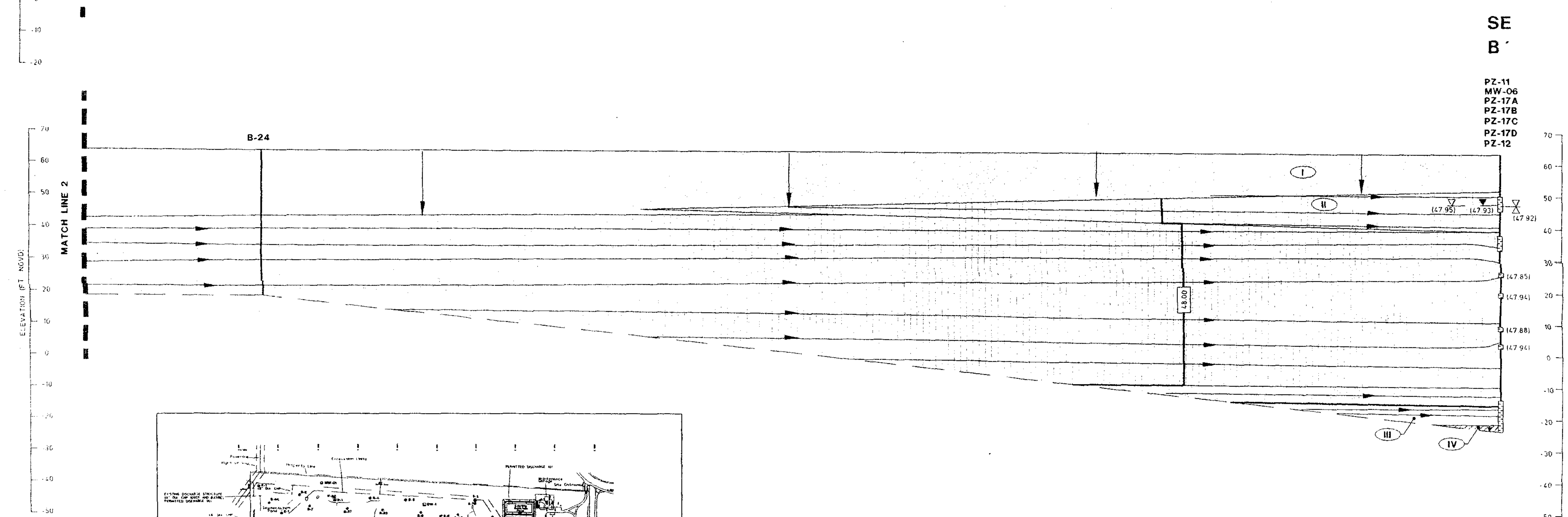
Drawn By:	D. ARDIS	1/96		Project No.	32711.100				
Designer:	S. REED	1/96		Drawing No.	32711ASP.DWG				
P.E.				Date Issued:	10-29-96				
Approved:	M. CALDWELL	1/96		Plot Time:	1:38 p.m.	DATE	NO.	REVISION	BY

WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

ISOPACH MAP OF STRATUM II

13
FIG. NO.

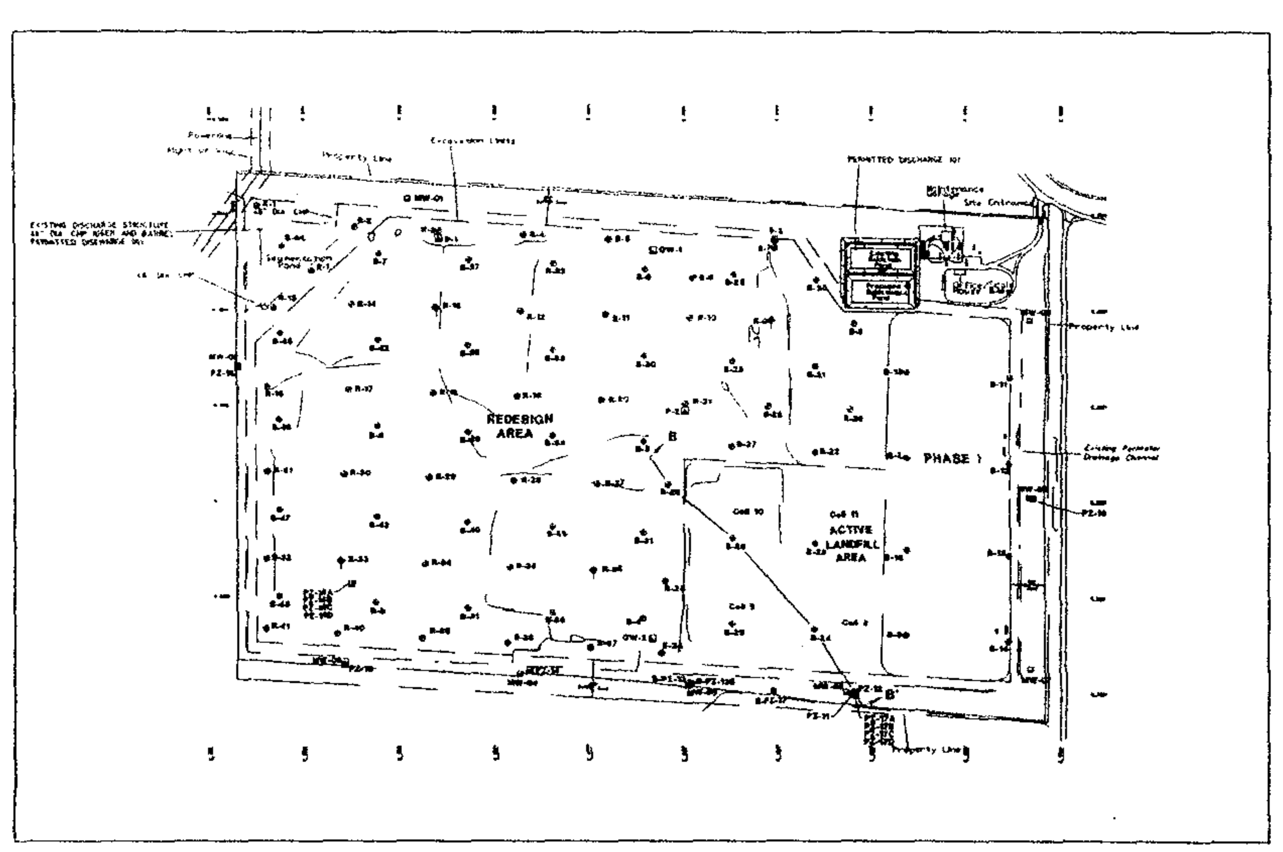


LEGEND

- 48.40 — EQUIPOTENTIAL LINE W/ EQUIPOTENTIAL HEAD ELEVATION (FT NGVD)
- GROUNDWATER FLOW LINE
- I — STRATIGRAPHIC UNIT
- (48.60) POTENTIOMETRIC ELEVATION (STRATUM II)
- (48.50) POTENTIOMETRIC ELEVATION (STRATUM III)
- (48.40) POTENTIOMETRIC ELEVATION (STRATUM III-BASE)

NOTE 6/25 MEASUREMENT EVENT

- SILTY CLAYS AND CLAY (CL/CH)
- SANDY TO CLAYEY SILT (ML)
- SILTY SAND AND SAND (SM/SP)
- SANDY GRAVEL AND GRAVELY SAND (SP/GP)
- CLAY TO WEATHERED SHALE (CH)



SECTION LOCATION MAP

N.T.S.

0 feet 20
HOIZONTAL SCALE
VERTICAL IS AS SHOWN

Description		Date	Ini
Drawn By	ARDIS	6/96	
Designer	CALDWELL	6/96	
Checked	SARA	6/96	
P.E.			
Approved			
Revision			
Revision			
Revision			
Project No	32711.100		
Drawing No	32711A18.DWG		
Date Issued	07-24-96		
Plot Time	2:21 p.m.		

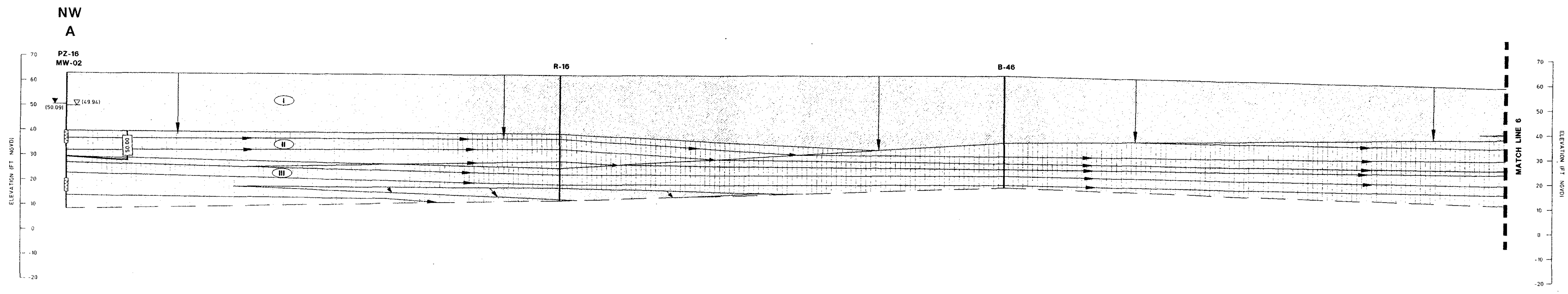
RUST ENVIRONMENT & INFRASTRUCTURE

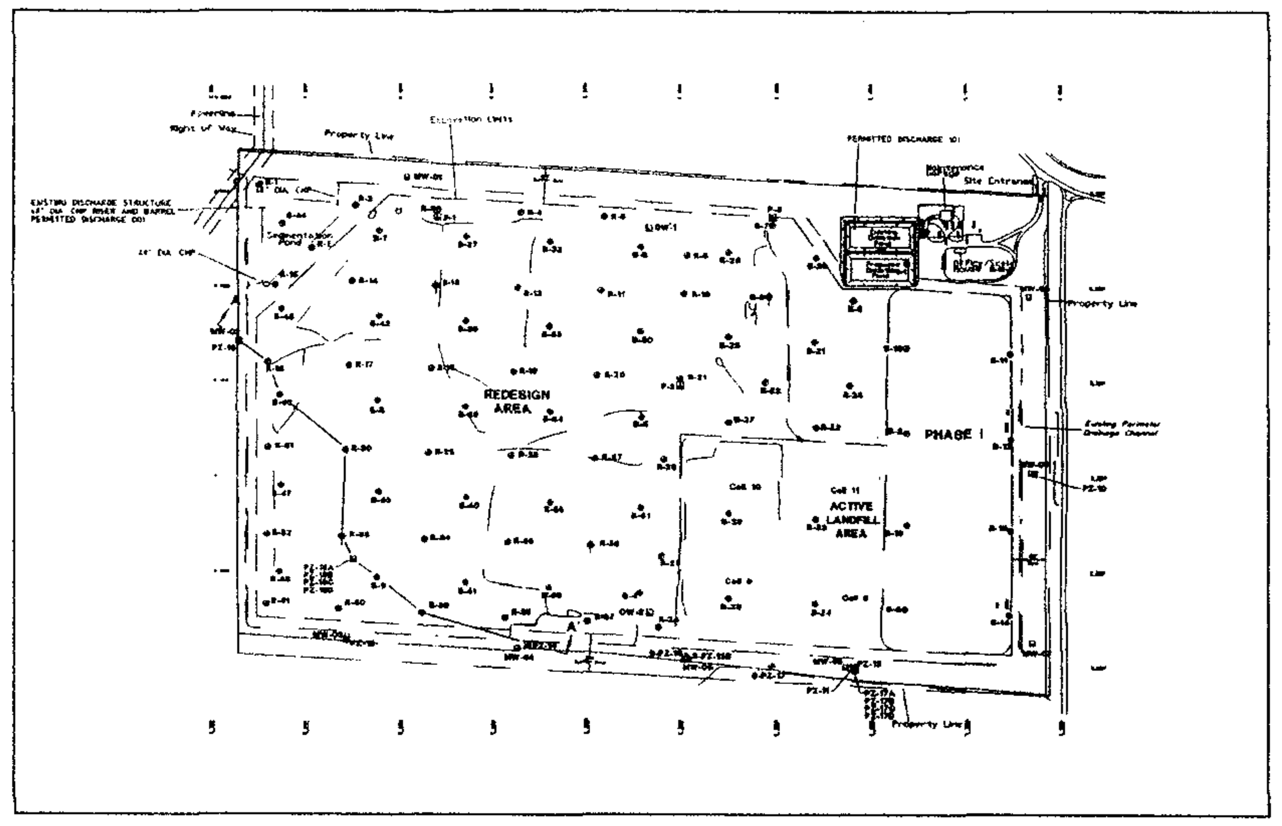
PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

CONCEPTUAL FLOW NET
SECTION B-B´ (SHEET 3)

14C
FIG NO





SECTION LOCATION MAP

N.T.S.

LEGEND

48.60	EQUIPOTENTIAL LINE W/ EQUIPOTENTIAL HEAD ELEVATION (FT NGVD)
	GROUNDWATER FLOW LINE
I	STRATIGRAPHIC UNIT
(48.60)	POTENTIOMETRIC ELEVATION (STRATUM II)
(48.50)	POTENTIOMETRIC ELEVATION (STRATUM III)
(48.40)	POTENTIOMETRIC ELEVATION (STRATUM III-BASE)
	NOTE: 6/25 MEASUREMENT EVENT
	SILTY CLAYS AND CLAY (CL/CH)
	SANDY TO CLAYEY SILT (ML)
	SILTY SAND AND SAND (SM/SP)
	SANDY GRAVEL AND GRAVELY SAND (SP/GP)
	CLAY TO WEATHERED SHALE (CH)

0 feet 20
HORIZONTAL SCALE
VERTICAL IS AS SHOWN

Description	Date	Ini.
Drawn By ARDIS	6/96	
Designer CALDWELL	6/96	
Checked SARA	6/96	
P.E.		
Approved		
Revision		
Revision		
Revision		
Project No.	32711.100	
Drawing No.	32711A20.DWG	
Date Issued	07-24-96	
Plot Time	2:25 p.m.	

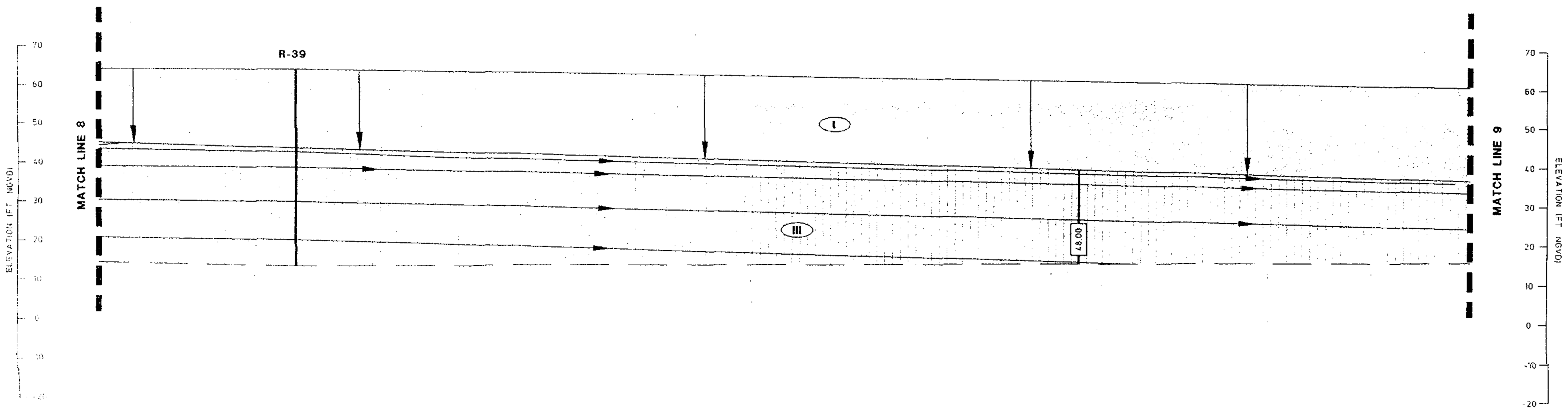
RUST ENVIRONMENT & INFRASTRUCTURE

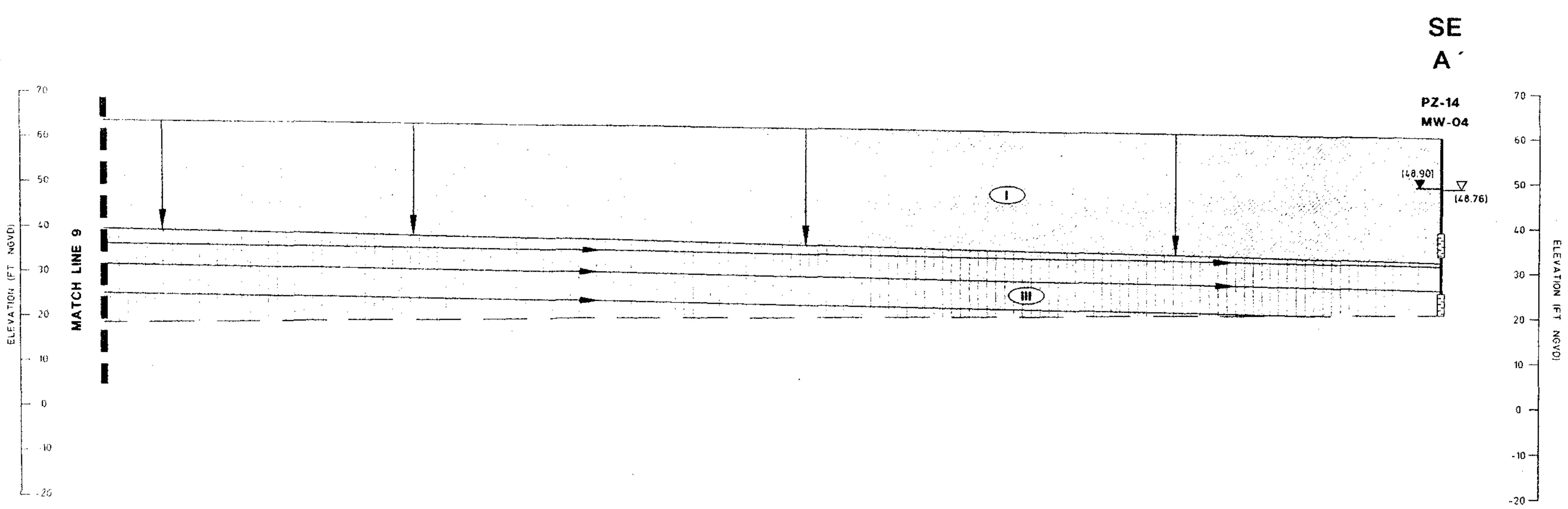
PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

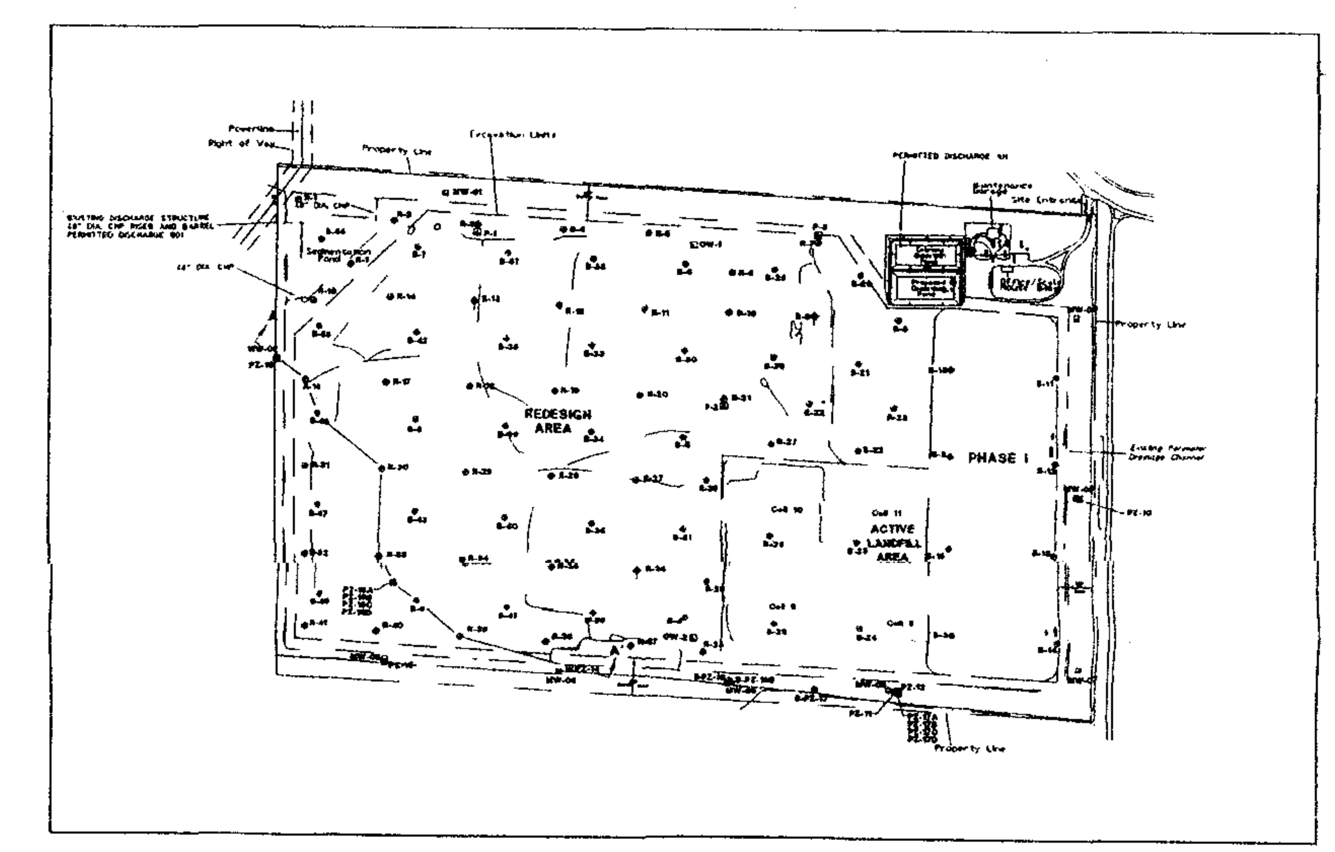
WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

CONCEPTUAL FLOWNET
SECTION A-A´ (SHEET 1)

14A
DWG. NO.







SECTION LOCATION MAP

N.T.S.

LEGEND

- 48.40 — EQUIPOTENTIAL LINE W/ EQUIPOTENTIAL HEAD ELEVATION (FT. NGVD)
- GROUNDWATER FLOW LINE
- (I) STRATIGRAPHIC UNIT
- (48.60) POTENTIOMETRIC ELEVATION (STRATUM II)
- (48.50) POTENTIOMETRIC ELEVATION (STRATUM III)
- (48.40) POTENTIOMETRIC ELEVATION (STRATUM III-BASE)
- NOTE: 6/25 MEASUREMENT EVENT
- SILTY CLAYS AND CLAY (CL/CH)
- SANDY TO CLAYEY SILT (ML)
- SILTY SAND AND SAND (SM/SP)
- SANDY GRAVEL AND GRAVELY SAND (SP/GP)
- CLAY TO WEATHERED SHALE (CH)

0 feet 20
HORIZONTAL SCALE
VERTICAL IS AS SHOWN

Description		Date	Ini
Drawn By	ARDIS	6/96	
Designer	CALDWELL	6/96	
Checked	SARA	6/96	
P.E.			
Approved			
Revision			
Revision			
Revision			
Project No	32711.100		
Drawing No	32711A19.DWG		
Date Issued	07-24-96		
Plot Time	2:30 p.m.		

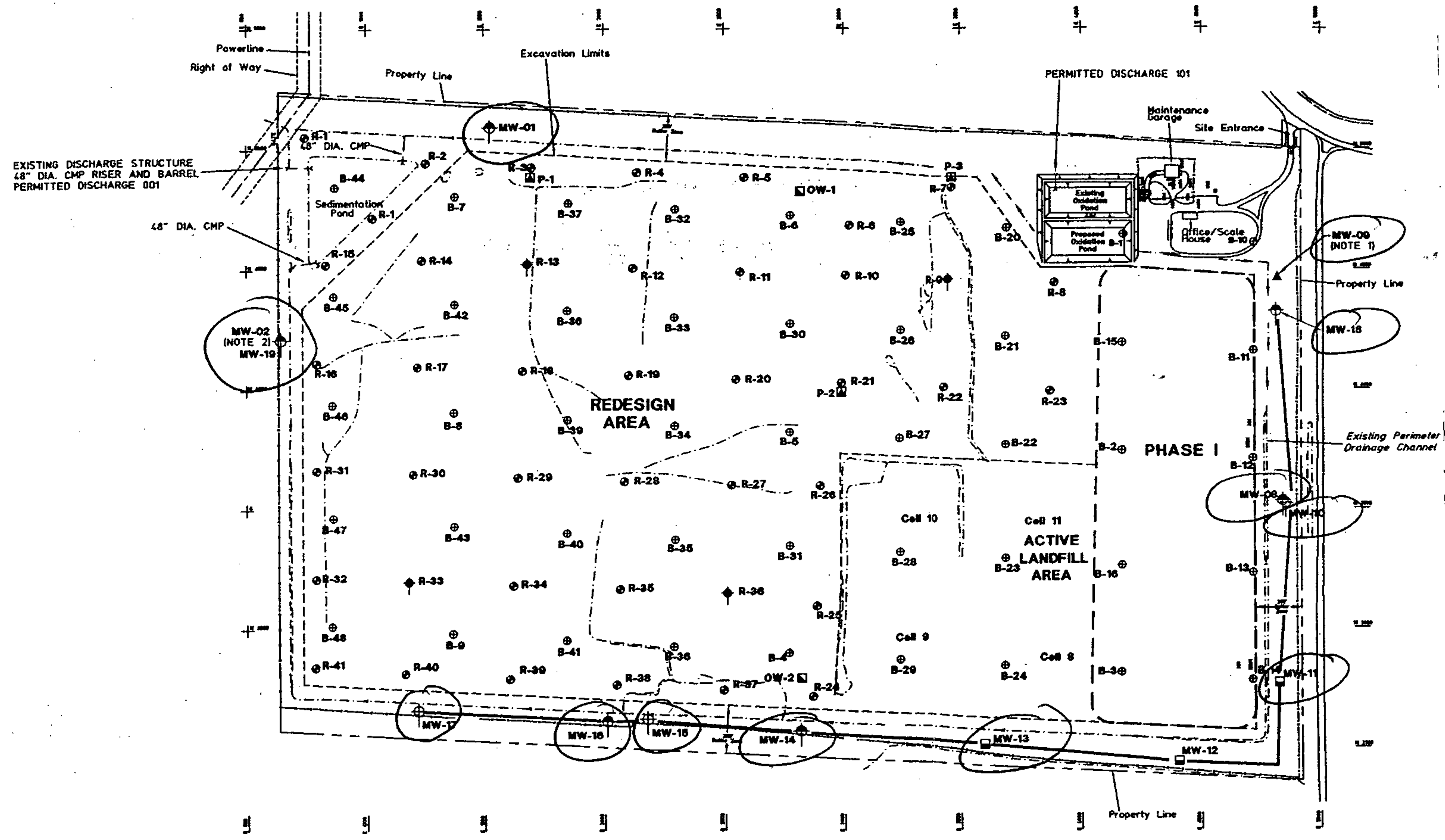
RUST ENVIRONMENT & INFRASTRUCTURE

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

CONCEPTUAL FLOW NET
SECTION A-A´ (SHEET 2)

14B
FIG. NO.



Flow Southeast

0 feet 500
Scale

LEGEND

- LIMIT OF PHASE I
- SURFACE WATER FLOW DIRECTION
- GRID COORDINATE
- PROPERTY BOUNDARY
- EXISTING FENCE
- EXISTING CULVERT
- POINT OF COMPLIANCE BOUNDARY
- RUST E & I BORING LOCATION
- RUST E & I 100' BORING LOCATION
- SOUTHWEST LABORATORIES, INC. 1984 BORING LOCATION (APPROX.)
- ABANDONED OBSERVATION WELL LOCATION
- RUST E & I PIEZOMETER LOCATION
- PROPOSED STRATUM III PIEZOMETER (MW-02, MW-09)

PROPOSED MONITOR WELL SYSTEM:

- STRATUM II WELL
- STRATUM III WELL
- STRATUM II/III WELL

NOTES:

1. MW-09 NOT INCLUDED IN PROPOSED MONITOR WELL NETWORK. ANALYZED FOR CHLORIDES ONLY.
2. MW-02 NOT INCLUDED IN PROPOSED MONITOR WELL NETWORK. ANALYZED FOR ESTABLISHMENT OF BACKGROUND DATA ONLY.

Re: Permit Installation Report file No. 32711 Dwg. 32711CSP.DWG.

Drawn By:	D. ARDIS	1/96		Project No.	32711.100				
Designer:	S. REED	1/96		Drawing No.	32711ASP.DWG				
P.E.				Date Issued:	10-29-96				
Approved:	M. CALDWELL	1/96		Plot Time:	1:38 p.m.	DATE	NO.	REVISION	BY

WASTE MANAGEMENT OF LOUISIANA, INC.
CLIENT

PERMIT MODIFICATION
MAGNOLIA SANITARY LANDFILL
MONROE, LOUISIANA
PROJECT TITLE

RUST ENVIRONMENT & INFRASTRUCTURE

PROPOSED MONITOR WELL NETWORK

15
FIG. NO.